Acquired with the assistance of the

Sylvia Augusta Brown

Fund

JOHN CARTER BROWN LIBRARY

Curtis Reed

The SEAMAN's Daily Assistant,

BEING

A Short, Easy, and Plain Method

OF KEEPING

A JOURNAL at SEA;

In which are contained,

RULES

SHEWING

How the Allowances for Leeway, Variation, Heave of the Sea, Set of Currents, &c. are to be made, and to correct the Dead-Reckoning by an Observation, in all Cases: And also all the TABLES that are any Ways necessary for the SEAMAN's Use in keeping a Journal.

By THOMAS HASELDEN,
Late Teacher of the MATHEMATICS in the ROYAL NAVY.

LONDON:
Printed for J. MOUNT and T. PAGE, on Tower-Hill,
M,DCC,LXXV.

TO THE

READER.

HAVING been educated in the Theory of Navigation, almoſt from my Childhood, and having had about ſixteen Years Experience of the practical Part, at Sea, both in the Merchants Service, and alſo as Teacher of the Mathematics in the Royal Navy; and having, in the Courſe of that Time, made a general Obſervation, that there are Numbers of Seamen who would gladly keep a Reckoning, had they any ſhort, eaſy, and plain Method to do it by; but are deterred from it by the Want of ſuch a Thing. And alſo, that there are many who have thrown their Money away to little or no Purpoſe, by going to School to ſome Maſters, (of which Sort there are too many) that they have only got a Smattering of the Theory, and a few Terms of Art by Rote, which enables them to talk in ſuch a Manner as to deceive thoſe that go to learn of them, by having never been at Sea, cannot know any thing of the Practice.

Therefore, for the Uſe of ſuch in particular, and of all other Seafaring Men in general, I have written the following Treatiſe; in which, I think, I have inſerted all the Rules, and all the Tables, with their Uſes, that are neceſſary to be uſed in any Caſe at Sea: And alſo, particular Rules for keeping a Journal, with the Manner of correcting the Dead-Reckoning by an Obſervation, either for one Day, or for a longer Time; the firſt of which, viz. Correcting for one Day, has been treated of by ſeveral Authors; but the latter, viz. Correcting for a longer Time, I know has been barely mentioned in ſeveral, but not particularly explained in any Author at all, I believe, at leaſt in none that I have read

read; And for that Reaſon I have done it in the Journal at the latter End of this Book, it being abſolutely neceſſary for every Man that keeps a Reckoning to know it; becauſe they are more likely to be out in their Reckoning, when they have been ſome Days without an Obſervation, than when they have one every Day, and conſequently more likely to have Occaſion to correct for three or four Days, than for a ſingle one.

I have not begun this Book with Arithmetic, as moſt of the Books on this Subject do; becauſe I think, that if any Perſon has had ſo little Education, as not to be capable of Adding, Subtracting, Multiplying, and Dividing, he will hardly be able to make any Progreſs, either in Arithmetic or Navigation, by the Help of Books alone, without the Aſſiſtance of a Maſter: So that I think putting ſuch Things into Books of this Kind, ſerve only to enhance the Price, and are of no Service to the Reader. And now having given an Account of the Reaſons that induced me to publiſh this Book (which I hope, and am pretty well aſſured, will be found the moſt uſeful Book of its Kind now in Print) for the daily Practice at Sea. I have nothing more to add, but to beg the Readers kind Acceptance of it.

And am,

Their humble Servant,

Thomas Haſelden.

THE

THE

CONTENTS.

1 A Table of Difference of Latitude and Departure to every ſingle Degree, and as far as 300 Miles Diſtance, from Page 1 to Page 45.

2 A Table of Numbers, for the readier finding the Courſe in the Tables of Difference of Latitude and Departure, when any two Sides are given, Page 46.

3 The Uſe of the two foregoing Tables, in working the ſix Caſes of Plain Sailing, Page 47 to Page 51.

4 The Uſe of the Tables of Difference of Latitude and Departure in working a Traverſe, Page 52.

5 To work any Caſe in Mercator, Middle Latitude, Parallel, or any Right-angled Plain Triangle, Pages 53 and 54.

6 The firſt Caſe of Mercator (being the moſt uſeful Caſe at Sea) particularly explained and worked at large, Pages 55 and 56.

7 A Table to turn Points into Degrees, *&c.* Page 56.

8 A Figure, ſhewing how many Points from the Meridian any Courſe ſteered is, Page 57.

9 A Table of Difference of Latitude and Departure, to every $\frac{1}{4}$ Point, and to 300 Miles Diſtance, Pages 58 to 73.

10 Tables of Numbers for any Days, and the Times anſwering to them, being of Uſe for the ready finding the Time of High-Water, at any Place, Pages 74 to 78.

11 The Uſe of the Tables of Numbers and Times, Page 70.

12 A Tide Table, ſhewing the Time of High-Water upon the Full and Change of the Moon, at any of the Places contained therein, Pages 80 to 83.

13 The Uſe of the three foregoing Tables in finding the Time of High-water at any Place, and on any Day, Page 84.

14 Tables of the Sun's Declination for 15 Years to come, Page 85 to 81

15 All

The CONTENTS.

15 A Table of the Variation of the Sun's Declination, Page 89
16 The Uſe of the Table of Declination, and its Variation, Page 90.
17 A Table of the Sun's Right Aſcenſion, Page 91.
18 A Table of the Right Aſcenſion and Declination of ſome of the principal fixed Stars, Page 92 and 93.
19 Rules for working an Obſervation by the Sun or Stars, Page 94 & 95.
20 The Uſe of the Table of the Sun and Stars Right Aſcenſion, P. 96.
21 A Table of the Latitudes and Longitudes of Places, Page 97 to 104.
22 Rules for Latitude, Pages 104 and 105.
23 Rules for Longitude, Pages 106, 107, and 108.
24 A Table of Meridional Parts to every Degree and Minute, with its Uſe, Pages 109 to 115.
25 A Table of Amplitudes, Pages 116 to 121.
26 The Uſe of the Table of Amplitudes, with Rules for finding the Variation of the Compaſs, Pages 121 to 125.
27 Rules for keeping a Journal, Pages 126 to 129.
28 Rules for correcting the Dead Reckoning by an Obſervation, Pages 130 to 132.
29 Rules for the Meridian Diſtance, Page 132.
30 A Journal with all its different Varieties of Variation, Leeway, Laying-to, Calms, Currents, Heave of the Sea, *&c.* and alſo all the different Caſes of correcting, from Page 133 to 155.
31 Rules to find what Courſe and Diſtance the Ship has made by the Reckoning, from one Place to another, Pages 155 and 156.
32 Rules to find the Bearing and Diſtance of any Place from the Ship, Page 156.
33 Rules for correcting from the Time of leaving the Land, to the firſt Obſervation, Pages 157 and 158.
34 Rules to lay off the Place of the Ship on the Mercator's Chart, and to find the Bearing and Diſtance of any Place from the Ship, Pages 159 and 160.

Note, All the forementioned Tables are newly and carefully calculated, and the Tables of Latitude and Longitude carefully corrected, from the beſt Authors and Charts.

A

TABLE

OF

DIFFERENCE of LATITUDE

AND

DEPARTURE

To every Single DEGREE

And as far as 300 Miles DISTANCE.

Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat.	Dep	Dist	Lat.	Dep
1	01.0	00.0	51	51.0	00.9	101	101.0	01.8	151	151.0	02.6	201	201.0	03.5	251	251.0	04.3
2	02.0	00.0	52	52.0	00.9	02	102.0	01.8	52	152.0	02.6	02	202.0	03.5	52	252.0	04.3
3	03.0	00.1	53	53.0	00.9	03	103.0	01.8	53	153.0	02.6	03	203.0	03.5	53	253.0	04.3
4	04.0	00.1	54	54.0	00.9	04	104.0	01.8	54	154.0	02.7	04	204.0	03.5	54	254.0	04.4
5	05.0	00.1	55	55.0	01.0	05	105.0	01.8	55	155.0	02.7	05	205.0	03.5	55	255.0	04.4
6	06.0	00.1	56	56.0	01.0	106	106.0	01.8	156	156.0	02.7	206	206.0	03.5	256	256,0	04.4
7	07.0	00,1	57	57.0	01.0	07	107.0	01.9	57	157.0	02.7	07	207.0	03.6	57	257.0	04.4
8	08.0	00.1	58	58.0	01,0	08	108.0	01.9	58	158.0	02.7	08	208.0	03.6	58	258.0	04.4
9	09.0	00,2	59	59.0	01.0	09	109.0	01.9	59	159.0	02.7	09	209.0	03.6	59	259.0	04.4
10	10.0	00.2	60	60.0	01.1	10	110.0	01.9	60	160.0	02.8	10	210.0	03.6	60	260.0	04.5
11	11.0	00.2	61	61.0	01.1	111	111.0	01,9	161	161.0	02.8	211	211.0	03.5	261	261.0	04.5
12	12.0	00.2	62	62.0	01.1	12	112.0	01.9	62	162.0	02.8	12	212.0	03.6	62	262.0	04.5
13	13.0	00.2	63	63.0	01.1	13	113.0	02.0	63	163.0	02.8	13	213.0	03.7	63	263.0	04.5
14	14.0	00.2	64	64.0	01.1	14	114.0	02.0	64	164.0	02.8	14	214.0	03.7	64	264.0	04.5
15	15.0	00.3	65	65.0	01.1	15	115.0	02.0	65	165.0	02.9	15	215.0	03.7	65	265.0	04.6
16	16.0	00.3	66	66.0	01.2	116	116.0	02.0	166	166.0	02.9	216	216.0	03.7	266	266.0	04.6
17	17.0	00.3	67	67.0	01.2	17	117.0	02,0	67	167.0	02,9	17	217.0	03.7	67	267.0	04.6
18	18.0	00.3	68	68.0	01.2	18	118.0	02,1	68	168.0	02.9	18	218.0	03.8	68	268.0	04.6
19	19.0	00.3	69	69.0	01.2	19	119.0	02,1	69	169.0	02.9	19	219.0	03.8	69	269.0	04.6
20	20.0	00.4	70	70.0	01.2	20	120.0	02.1	70	170.0	02.9	20	220.0	03.8	70	270.0	04.6
21	21.0	00.4	71	71.0	01.2	121	121.0	02.1	171	171.0	03.0	221	221.0	03.8	271	271.0	04.7
22	22.0	00.4	72	72.0	01.3	22	122.0	02.1	72	172.0	03.0	22	222.0	03.8	72	272.0	04.7
23	23.0	00.4	73	73.0	01.3	23	123.0	02.1	73	173.0	03.0	23	223.0	03.8	73	273.0	04.7
24	24.0	00.4	74	74.0	01.3	24	124.0	02.2	74	174.0	03 0	24	224.0	03.9	74	274.0	04.7
25	25.0	00.4	75	75.0	01.3	25	125.0	02.2	75	175.0	03.0	25	225.0	03.9	75	275.0	04,7
26	26.0	00.5	76	76.0	01.3	126	126.0	02.2	176	176.0	03.0	226	226.0	03.9	276	276.0	04.7
27	27.0	00.5	77	77.0	01.3	27	127.0	02.2	77	177.0	03,1	27	227.0	03.9	77	277.0	04.8
28	28.0	00.5	78	78.0	01'4	28	128,0	02.2	78	178,0	03.1	28	228.0	03.9	78	278.0	04.8
29	29.0	00.5	79	79.0	01.4	29	129.0	02.2	79	179.0	03.1	29	229,0	03.9	79	279.0	04.8
30	32.0	00.5	80	80.0	01.4	30	130.0	02.3	80	180.0	03.1	30	230.0	04.0	80	280 0	04.8
31	31.0	00.5	81	81.0	01.4	131	131.0	02.3	181	181.0	03.1	231	231.0	04.0	281	281.0	04.8
32	32.0	00.6	82	82.0	01.4	32	132.0	02.3	82	182.0	03.1	32	232.0	04.0	82	282 0	04.8
33	33.0	00.6	83	83 0	01.5	33	133.0	02.3	83	183.0	03.2	33	233.0	04.0	83	283.0	04.9
34	34.0	00.6	84	84.0	01.5	34	134.0	02,3	84	184.0	03.2	34	234.0	04.0	84	284.0	04.9
35	35.0	00,6	85	85.0	01.5	35	135.0	02.3	85	185.0	03.2	35	235.0	04.0	85	285.0	04.9
36	36.0	00.6	86	86.0	01.5	136	136.0	02.4	186	186.0	03.2	236	236.0	04.1	286	286.0	04.9
37	37.0	00.6	87	87.0	01.5	37	137.0	02.4	87	187.0	03.2	37	237.0	04.1	87	287.0	04.9
38	38.0	00.7	88	88.0	01.5	38	138.0	02.4	88	188.0	03.2	38	238.0	04.1	88	288,0	04.9
39	39.0	00.7	89	89.0	01.6	39	139.0	02.4	89	189.0	03.3	39	239,0	04.1	89	289.0	05.0
40	40.0	00.7	90	90.0	01.6	40	140.0	02.4	90	190.0	03.3	40	240.0	04 1	90	290.0	05.0
41	41.0	00.7	91	91.0	01.6	141	141.0	02,4	191	191.0	03.3	241	241.0	04.1	291	291.0	05.0
42	42.0	00.7	92	92.0	01.6	42	142.0	02.5	92	192.0	03.3	42	242.0	04.2	92	292.0	05.0
43	43.0	00.8	93	93.0	01.6	43	143,0	02.5	93	193.0	03.3	43	243.0	04.2	93	293.0	05.0
44	44.0	00.8	94	94.0	01.6	44	144.0	02.5	94	194.0	03.3	44	244.0	04.2	94	294.0	05.0
45	45.0	00.8	95	95.0	01.7	45	145.0	02.5	95	195.0	03.4	45	245.0	04.2	95	295.0	05.1
46	46.0	00.8	96	96.0	01.7	146	146.0	02.5	196	196.0	03.4	246	246.0	04.2	296	296.0	05.1
47	47.0	00.8	97	97.0	01.7	47	147.0	02.5	97	197.0	03.4	47	247.0	04.2	97	297.0	05.1
48	48.0	00,8	98	98.0	01.7	48	148,0	02,6	98	198.0	03.4	48	248.0	04,3	98	298.0	05.1
49	49.0	00,9	99	99.0	01.7	49	149.0	02,6	99	199.0	03.4	49	249.0	04.3	99	299.0	05.1
50	50.0	00.9	100	100.0	01.7	150	050.0	02.6	200	200.0	03.4	250	250.0	04.3	300	300.0	05.1
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Lat	Dep

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	La	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	01.0	00.0	51	51.0	01.8	101	100.9	03.5	151	150.9	05.3	201	200.9	07.0	251	250.8	08.8
2	02.0	00.1	52	52.0	01.8	02	101.9	03.6	52	151.9	05.3	02	201.9	07.1	52	251.8	08.8
3	03.0	00.1	53	53.0	01.8	03	102.9	03.6	53	152.9	05.4	03	202.9	07.1	53	252.8	08.9
4	04.0	00.1	54	54.0	01.9	04	103.9	03.6	54	153.9	05.4	04	203.9	07.1	54	253.8	08.9
5	05.0	00.2	55	55.0	01.9	05	104.9	03.7	55	154.9	05.4	05	204.9	07.2	55	254.8	08.9
6	06.0	00.2	56	56.0	02.0	106	105.9	03.7	156	155.9	05.5	206	205.9	07.2	256	255 8	09.0
7	07.0	00,2	57	57.0	02.0	07	106.9	03.7	57	156.9	05.5	07	206.9	07.2	57	256.8	09.0
8	08.0	00.3	58	58.0	02.0	08	107.9	03.8	58	157.9	05.5	08	207.9	07.3	58	257.8	09.0
9	09.0	00.3	59	59.0	02.1	09	108.9	03.8	59	158.9	05.6	09	208.9	07.3	59	258.8	09.1
10	10.0	00.4	60	60.0	02.1	10	109.9	03.9	60	159.9	05.6	10	209.9	07.4	60	259.8	09.1
11	11.0	00.4	61	61,0	02.1	111	110.9	03.9	161	160.9	05,6	211	210.9	07.4	261	260,8	09.1
12	12.0	00.4	62	62.0	02.2	12	111.9	03.9	62	161 9	05.7	12	211.9	07.4	62	261.8	09.2
13	13.0	00.5	63	63.0	02.2	13	112.9	04.0	63	162.9	05.7	13	212.9	07.5	63	262.8	09.2
14	14.0	00.5	64	64.0	02.2	14	113.9	04.0	64	163.9	05.7	14	213.9	07.5	64	263.8	09.2
15	15.0	00.5	65	65.0	02.3	15	114.9	04,0	65	164.9	05.8	15	214.9	07.5	65	264.8	09.3
16	16.0	00.6	66	66.0	02.3	116	115.9	04.1	166	165.9	05.8	216	115.9	07.6	266	265.8	09.3
17	17.0	00.6	67	67.0	02.3	17	116.9	04.1	67	166.9	05.8	17	216.9	07.6	67	266.8	09.3
18	18.0	00.6	68	68.0	02.4	18	117.9	04.1	68	167.9	05.9	18	217.9	07.6	68	267.8	09.4
19	19.0	00.7	69	69.0	02.4	19	118.9	04.2	69	168.9	05.9	19	218.9	07.7	69	268.8	09.4
20	20 0	00.7	70	70.0	02.4	20	119.9	04.2	70	169.9	06.0	20	219.9	07.7	70	269.8	09.5
21	21.0	00.7	71	71.0	02.5	121	120.9	04.2	171	170.9	06.0	221	220.9	07.7	271	270.8	09.5
22	22.0	00.8	72	72.0	02.5	22	121.9	04.3	72	171.9	06.0	22	221.9	07.8	72	271.8	09.5
23	23.0	00.8	73	73.0	02.5	23	122.9	04.3	73	172.9	06.1	23	222.9	07.8	73	272.8	09.6
24	24.0	00.8	74	74.0	02.6	24	123.9	04.3	74	173.9	06.1	24	223.9	07.8	74	273.8	09.6
25	25.0	00.9	75	75.0	02.6	25	124,9	04.4	75	174.9	06.1	25	224.9	07.9	75	274.8	09.6
26	26.0	00.9	76	76.0	02.7	126	125.9	04.4	176	175.9	06.2	226	225.9	07.9	276	275.8	09.7
27	27.0	00.9	77	77.0	02.7	27	126.9	04.4	77	176.9	06.2	27	226.9	07.9	77	276.8	09.7
28	28.0	01.0	78	78.0	02.7	28	127.9	04.5	78	177.9	06.2	28	227.9	08.0	78	277.8	09.7
29	29.0	01.0	79	79.0	02.8	29	128.9	04.5	79	178.9	06.3	29	228.9	08.0	79	278.8	09.8
30	30.0	01.1	80	80.0	02.8	30	129.9	04.6	80	179.9	06.3	30	229.9	08.1	80	279.8	09.8
31	31.0	01.1	81	81.0	02.8	131	130.9	04.6	181	180.9	06.3	231	230.9	08.1	281	280.8	09.8
32	32.0	01.1	82	81.9	02.9	32	131.9	04.6	82	181.9	06.4	32	231.9	08.1	82	281.8	09.9
33	33.0	01.2	83	82.9	02.9	33	132.9	04.7	83	182.9	06.4	33	232.9	08.2	83	282.8	09.9
34	34.0	01.2	84	83.9	02.9	34	133.9	04.7	84	183.9	06.4	34	253.9	08.2	84	283.8	10.9
35	35.0	01.2	85	84.9	03.0	35	134.9	04.7	85	184.9	06.5	35	234.9	08,2	85	284.8	10.0
36	36.0	01.3	86	85 9	03 0	136	135.9	04.8	186	185.9	06.5	236	235.9	08.3	286	285.8	10.0
37	37.0	01.3	87	86.9	03.0	37	136.9	04.8	87	186,9	06.5	37	236.9	08.3	87	286.8	10.0
38	38.0	01 3	88	87.9	03.1	38	137.9	04.8	88	187.9	06.6	38	237.9	08.3	88	287.8	10.1
39	39.0	01.4	89	88.9	03.1	39	138.9	04.9	89	188.9	06.6	39	238.9	08 4	89	288.8	10.1
40	40.0	01,4	90	89.9	03.1	40	139 9	04.9	90	189.9	06.7	40	239.9	08.4	90	289.8	10.2
41	41.0	01,4	91	90.9	03.2	141	140,9	04.9	191	190.9	06.7	241	240.9	08.4	291	290.8	10.2
42	42.0	01.5	92	91.9	03.2	42	141.9	05.0	92	191.9	06.7	42	241.9	08.5	92	291.8	10.2
43	43.0	01.5	93	92.9	03.2	43	142.9	05.0	93	192.9	06.8	43	242.9	08.5	93	292.8	10.3
44	44.0	01.5	94	93.9	03.3	44	143.9	05.0	94	193.9	06.8	44	243.9	08.5	94	293.8	10.3
45	45.0	01.6	95	94.9	03.3	45	144.9	05.1	95	194.9	06,8	45	244.9	08.6	95	294.8	10.3
46	46.0	01.6	96	95.9	03.4	146	145.9	05.1	196	195.9	06.9	246	245.9	08.6	296	295.8	10.4
47	47.0	01.6	97	96,9	03.4	47	146.9	05.1	97	196.9	06.9	47	246,9	08.6	97	296.8	10.4
48	48.0	01.7	98	97.9	03.4	48	147.9	05.2	98	197.9	06.9	48	247.9	08.7	98	297.8	10.4
49	49.0	01.7	99	98.9	03.5	49	148,9	05.2	99	198.9	07.0	49	248.9	08.7	99	298,8	10.5
50	50.0	01.7	100	99.9	03.5	50	149.9	05.3	200	199.9	07.0	50	249.9	08.8	300	299.8	10.5
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat.

Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	01.0	00.1	51	50.9	02.7	101	100.9	05.3	151	150.8	07.9	201	200.7	10.5	251	250.6	13.1
2	02.0	00.1	52	51.9	02.7	02	101.9	05.3	52	151.8	08.0	02	201.7	10.6	52	251.6	13.2
3	03.0	00.2	53	52.9	02.8	03	102.9	05.4	53	152.8	08.0	03	202.7	10.6	53	252.6	13.2
4	04.0	00.2	54	53.9	02.8	04	103.9	05.4	54	153.8	08.1	04	203.7	10.7	54	253.6	13.3
5	05.0	00.3	55	54.9	02.9	05	104.9	05.5	55	154.8	08.1	05	204.7	10.7	55	254.6	13.3
6	06.0	00.3	56	55.9	02.9	106	105.9	05.5	156	155.8	08.2	206	205.7	10.8	256	255.6	13.4
7	07.0	00,4	57	56.9	03.0	07	106.9	05.6	57	156.8	08.2	07	206.7	10.8	57	256,6	13.4
8	08.0	00.4	58	57.9	03,0	08	107.8	05.7	58	157.8	08.3	08	207.7	10.9	58	257.6	13.5
9	09.0	00,5	59	58.9	03.1	09	108.8	05.7	59	158.8	08.3	09	208.7	10.9	59	258.6	13.6
10	10.0	00.5	60	59.9	03.1	10	109.8	05.8	60	159.8	08.4	10	209.7	11.0	60	259.6	13 6
11	11.0	00.6	61	60.9	03.2	111	110.8	05,8	161	160.8	08.4	211	210.7	11.0	261	260.6	13.7
12	12.0	00.6	62	61.9	03.2	12	111.8	05.9	62	161.8	08.5	12	211.7	11.1	62	261.6	13.7
13	13.0	00.7	63	62.9	03.3	13	112.8	05.9	63	162.8	08.5	13	212.7	11.1	63	262,6	13.8
14	14.0	00.7	64	63.9	03.3	14	113.8	06.0	64	163.8	08.6	14	213.7	11.2	64	263.6	13.8
15	15.0	00.8	65	64.9	03.4	15	114.8	06.0	65	164.8	08.6	15	214.7	11.2	65	264.6	13.9
16	16.0	00.8	66	65.9	03.5	116	115.8	06.1	166	165.8	08.7	216	215.7	11 3	266	265.6	13.9
17	17.0	00.9	67	66.9	03.5	17	116.8	06,1	67	166.8	08.7	17	216.7	11.4	67	266.6	14.0
18	18.0	00.9	68	67.9	03.6	18	117.8	06.2	68	167.8	08,8	18	217.7	11.4	68	267.6	14.0
19	19.0	01.0	69	68.9	03.6	19	118.8	06.2	69	168.8	08.8	19	218.7	11.5	69	268.6	14.1
20	20.0	01.0	70	69.9	03.7	20	119.8	06.3	70	169.8	08.9	20	219.7	11.5	70	269.6	14.1
21	21.0	01.1	71	70.9	03.7	121	120.8	06.3	171	170.8	09.0	221	220.7	11.6	271	270.6	14.2
22	22.0	01.1	72	71.9	03.8	22	121.8	06.4	72	171.8	09.0	22	221.7	11.6	72	271.6	14.2
23	23.0	01.2	73	72.9	03.8	23	122.8	06.4	73	172.8	09.1	23	222.7	11.7	73	272.6	14.3
24	24.0	01.3	74	73.9	03.9	24	123.8	06.5	74	173.8	09 1	24	223.7	11.7	74	273.6	14.3
25	25.0	01.3	75	74.9	03.9	25	124.8	06.5	75	174.8	09.2	25	224.7	11.8	75	274.6	14,4
26	26.0	01.4	76	75.9	04 0	126	125.8	06.6	176	175.8	09.2	226	225.7	11.8	276	275.6	14.4
27	27.0	01.4	77	76.9	04.0	27	126.8	06.6	77	176.8	09,3	27	226.7	11.9	77	276.6	14.5
28	28.0	01.5	78	77.9	04.1	28	127.8	06.7	78	177.8	09.3	28	227.7	11.9	78	277.6	14.5
29	29.0	01.5	79	78.9	04.1	29	128,8	06.8	79	178.7	09 4	29	228.7	12.0	79	278.6	14.6
30	30.0	01.6	80	79.9	04.2	30	129.8	06.8	80	179.7	09.4	30	229,7	12.0	80	279.6	14.7
31	31.0	01.6	81	80.9	04.2	131	130.8	06.9	181	180.7	09.5	231	230.7	12.1	281	280.6	14.7
32	32.0	01.7	82	81.9	04.3	32	131.8	06.9	82	181.7	09.5	32	231.7	12.1	82	281.6	14.8
33	33.0	01.7	83	82.9	04.3	33	132.8	07.0	83	182.7	09.6	33	232.7	12.2	83	282 6	14.8
34	34.0	01.8	84	83 9	04.4	34	133.8	07,0	84	183.7	09.6	34	233.7	12.2	84	283.6	14.9
35	35.0	01,8	85	84.9	04.4	35	134.8	07.1	85	184.7	09.7	35	234.7	12.3	85	284.6	14.9
36	35.9	01.9	86	85.9	04.5	136	135.8	07.1	186	185.7	09.7	236	235.7	12.3	286	285.6	15.0
37	36.9	01.9	87	86.9	04.6	37	136.8	07.2	87	186.7	09.8	37	236.7	12.4	87	286.6	15.0
38	37.9	02.0	88	87.9	04.6	38	137.8	07.2	88	187.7	09.8	38	237.7	12.5	88	287.6	15.1
39	38.9	02.0	89	88.9	04.7	39	138.8	07.3	89	188.7	09.9	39	238.7	12.5	89	288,6	15.1
40	39.9	02.1	90	89.9	04.7	40	139.8	07.3	90	189.7	09.9	40	239,7	12 6	90	289.6	15.2
41	40.9	02.1	91	90.9	04.8	141	140.8	07,4	191	190.7	10.0	241	240.7	12.6	291	290.6	15.2
42	41.9	02.2	92	91.9	04.8	42	141.8	07.4	92	191.7	10.0	42	241.7	12.7	92	291.6	15.3
43	42.9	02.2	93	92.9	04.9	43	142.8	07.5	93	192.7	10.1	43	242.7	12.7	93	292.6	15.3
44	43.9	02.3	94	93.9	04.9	44	143,8	07.5	94	193.7	10.1	44	243.7	12.8	94	293.6	15.4
45	44.9	02.4	95	94.9	05.0	45	144.8	07.6	95	194.7	10.2	45	244.7	12.8	95	294.6	15.4
46	45.9	02.4	96	95.9	05.0	146	145.8	07.6	196	195.7	10.3	246	245.7	12.9	296	295.6	15.5
47	46.9	02.5	97	96.9	05.1	47	146.8	07.7	97	196.7	10.3	47	246.7	12.9	97	296.6	15.5
48	47.9	02.5	98	97.9	05.1	48	147.8	07.7	98	197.7	10.4	48	247.7	13,0	98	297.6	15.6
49	48.9	02.6	99	98.9	05.2	49	148,8	07.8	99	198.7	10.4	49	248.7	13.0	99	298.6	15.6
50	49.9	02.6	100	99.9	05.2	150	149.8	07.9	200	199.7	10.5	250	249.7	13.1	300	299.6	15.7
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Dep	Lat

for 87 Deg.

Difference of Latitude and Departure for 4 Deg.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep
1	01.0	00.1	51	50.9	03.6	101	100.8	07.0	151	150.6	10.5	201	200.5	14.0	251	250.4	17.5
2	02.0	00.1	52	51.9	03.6	02	101.8	07.1	52	151.6	10.6	02	201.5	14.1	52	251.4	17.6
3	03.0	00.2	53	52.9	03.7	03	102.8	07.2	53	152.6	10.7	03	202.5	14.1	53	252.4	17.6
4	04.0	00.3	54	53.9	03.8	04	103.8	07.2	54	153.6	10.7	04	203.5	14.2	54	253.4	17.7
5	05.0	00.3	55	54.9	03.8	05	104.7	07.3	55	154.6	10.8	05	204.5	14.3	55	254.4	17.8
6	06.0	00.4	56	55.9	04.9	106	105.7	07.4	156	155.6	10.9	206	205.5	14.4	256	255.4	17.8
7	07.0	00.5	57	56.9	04.0	07	106.7	07.5	57	156.6	10.9	07	206,5	14.4	57	256.4	17.9
8	08,0	00.6	58	57.9	04.0	08	107.7	07.5	58	157.6	11.0	08	207.5	14.5	58	257.4	18.0
9	09.0	00.6	59	58.9	04.1	09	108.7	07.6	59	158.6	11.1	09	208.5	14.6	59	258.4	18.1
10	10.0	00.7	60	59.9	04,2	10	109.7	07.7	60	159.6	11.2	10	209.5	14.6	60	259.4	18.1
11	11.0	00.8	61	60.9	04.3	111	110.7	07.7	161	160.6	11.2	211	210.5	14.7	261	260.4	18.2
12	12.0	00.8	62	61.9	04.3	12	111.7	07.8	62	161.6	11.3	12	211.5	14.8	62	261.4	18.3
13	13.0	00.9	63	62.8	04.4	13	112.7	07.9	63	162.6	11.4	13	212.5	14.8	63	262,4	18.3
14	14.0	01.0	64	63.8	04.5	14	113.7	07.9	64	163.6	11.4	14	213.5	14.9	64	263.4	18.4
15	15.0	01.0	65	64.8	04.5	15	114.7	08.0	65	164.6	11.5	15	214.5	15.0	65	264.4	18.5
16	16.0	01.1	66	65.8	04.6	116	115.7	08.1	166	165.6	11.6	216	215.5	15.1	266	265.4	18.5
17	17.0	01.2	67	66.8	04.7	17	116.7	08.2	67	166.6	11.6	17	216.5	15.1	67	266.4	18.6
18	18.0	01.3	68	67.8	04.7	18	117.7	08.3	68	167.6	11.7	18	217.5	15.2	68	267.4	18.7
19	19.0	01.3	69	68.8	04.8	19	118.7	08.3	69	168.6	11.8	19	218.5	15.3	69	268.4	18.7
20	20.0	01.4	70	69.8	04.9	20	119.7	08.4	70	169.6	11.8	20	219.5	15.3	70	269.4	18.8
21	20,9	01.5	71	70.8	05.0	121	120.7	08.4	171	170.6	11.9	121	220.5	15.4	271	270.3	18.9
22	21.9	01.5	72	71.8	05.0	22	121.7	08.5	72	171.6	12.0	22	221.5	15.5	72	271.3	19.0
23	22.9	01.6	73	72.8	05.1	23	122.7	08.6	73	172.6	12.1	23	222.5	15.5	73	272.3	19.0
24	23.9	01.7	74	73.8	05.2	24	123.7	08.6	74	173.6	12.1	24	223.5	15.6	74	273.3	19.1
25	24.9	01.7	75	74.8	05.2	25	124.7	08.7	75	174.6	12.2	25	224.5	15.7	75	274.3	19.2
26	25.9	01.8	76	75.8	05.3	126	125.7	08.8	176	175.6	12.3	226	225.5	15.8	276	275,3	19.2
27	26.9	01.9	77	76.8	05.4	27	126.7	08.9	77	176.6	12.3	27	226.5	15.8	77	276.3	19.3
28	27.9	02.0	78	77.8	05.4	28	127.7	08.9	78	177.6	12.4	28	227.5	15.9	78	277.3	19.4
29	28.9	02.0	79	78.8	05.5	29	128.7	09.0	79	178.6	12.5	29	228.5	16.0	79	278.3	19.4
30	29.9	02.1	80	79.8	05.6	30	129.7	09.1	80	179.6	12.5	30	229.4	16.0	80	279.3	19.5
31	30.9	02.2	81	80.8	05.7	131	130.7	09.1	181	180.6	12.6	231	230,4	16.1	281	280.3	19.6
32	31.9	02.2	82	81.8	05.7	32	131.7	09.2	82	181.6	12.7	32	231.4	16.2	82	281.3	19.7
33	32.9	02.3	83	82.8	05.8	33	132.7	09.3	83	182.6	12.8	33	232.4	16.2	83	282.3	19.7
34	33.9	02.4	84	83.8	05.9	34	133.7	09.3	84	183.6	12.8	34	233.4	16.3	84	283.3	19.8
35	34.9	02.4	85	84.8	05.9	35	134.7	09.4	85	184.6	12.9	35	234.4	16.4	85	284.3	19.9
36	35.9	02.5	86	85.8	06.0	136	135.7	09.5	186	185.6	13.0	236	235.4	16.4	286	285.3	19.9
37	36.9	02.6	87	86.8	06.1	37	136.7	09.5	87	186.6	13.0	37	236.4	16.5	87	286.3	20.0
38	37.9	02.7	88	87.8	06.1	38	137.7	09.6	88	187.5	13.1	38	237.4	16.6	88	287.3	20.1
39	38.9	02.7	89	88.8	06.2	39	138.7	09.7	89	188.5	13.2	39	238.4	16.7	89	288.3	20.1
40	39.9	02.8	90	89.8	06.3	40	139.7	09.8	90	189.5	13.2	40	239.4	16.7	90	289.3	20.2
41	40.9	02.9	91	90.8	06.4	141	140.7	09.8	191	190.5	13.3	241	240.4	16.8	291	290.3	20.3
42	41.9	02.9	92	91.8	06.4	42	141.7	09.9	92	191.5	13.4	42	241.4	16.9	92	291.3	20.4
43	42.9	03.0	93	92.8	06.5	43	142.7	10.0	93	192.5	13.5	43	242.4	16.9	93	292.3	20.4
44	43,9	03.1	94	93.8	06.6	44	143 7	10.0	94	193.5	13.5	44	243.4	17.0	94	293.3	20.5
45	44.9	03.1	95	94.8	06.6	45	144.7	10.1	95	194.5	13.6	45	244.4	17.1	95	294.3	20.6
46	45.9	03.2	96	95.8	06.7	146	145.6	10.2	196	195.5	13.7	246	245.4	17.1	296	295.3	20.6
47	46.9	03.3	97	96.8	06.8	47	146.6	10.2	97	196.5	13.7	47	246.4	17.2	97	296.3	20.7
48	47.9	03.4	98	97.8	06.8	48	147.6	10.3	98	197.5	13.8	48	247.4	17.3	98	297.3	20.8
49	48.9	03.4	99	98.8	06.9	49	148.6	10.4	99	198.5	13.9	49	248.4	17.4	99	298.3	20.8
50	49.9	03.5	100	99.8	07.0	150	149.6	10.5	200	199.5	13.9	250	249.4	17.4	300	299,3	20.9
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep
1	01.0	00.1	51	50.8	04.4	101	100.6	08.8	151	150.4	13.1	201	200.2	17.5	251	250.0	21.8
2	02.0	00.2	52	51.8	04.5	02	101.6	08.9	52	151.4	13.2	02	201.2	17.6	52	251.0	21.9
3	03.0	00.3	53	52.8	04.6	03	102.6	09.0	53	152.4	13.3	03	202.2	17.7	53	252.0	22.0
4	04.0	00.3	54	53.8	04.7	04	103.6	09.0	54	153.4	13.4	04	203.2	17.7	54	253.0	22.1
5	05.0	00.4	55	54.8	04.8	05	104.6	09.1	55	154.4	13.5	05	204.2	17.8	55	254.0	22.2
6	06.0	00.5	56	55,8	04.9	106	105.6	09.2	156	155.4	13.6	206	205.2	17.9	256	255 0	22.3
7	07.0	00,6	57	56.8	05.0	07	106.6	09.3	57	156.4	13.7	07	206.2	18.0	57	256.0	22.4
8	08.0	00.7	58	57.8	05.1	08	107.6	09.4	58	157.4	13.7	08	207.2	18.1	58	257.0	22.4
9	09 0	00.8	59	58.8	05.1	09	108.6	09.5	59	158.4	13.8	09	208.2	18.2	59	258.0	22.5
10	10.0	00.9	60	59.8	05.2	10	109.6	09.6	60	159.4	13.9	10	209.2	18,3	60	259.0	22.6
11	11.0	01.0	61	60.8	05.3	111	110.6	00.7	161	160.4	14.0	211	210.2	18.4	261	260,0	22.7
12	12.0	01.0	62	61,8	05.4	12	111.6	09.7	62	161 4	14.1	12	211,2	18.4	62	261.0	22.8
13	12.9	01.1	63	62.8	05.5	13	112.6	09.8	63	162.4	14.2	13	212,2	18.5	63	262.0	22.9
14	13.9	01.2	64	63.8	05.6	14	113.6	09.9	64	163.4	14.3	14	213.2	18.6	64	263.0	23.0
15	14.9	01.3	65	64.8	05.7	15	114.6	10.0	65	164.4	14.4	15	214.2	18.7	65	264.0	23.1
16	15.9	01.4	66	65.7	05.8	116	115.6	10.1	166	165.4	14.4	216	115.2	18.8	266	265.0	23.1
17	16.9	01.5	67	66.7	05.8	17	116.6	10.2	67	166.4	14.5	17	216.2	18.9	67	266.0	23.2
18	17.9	01.6	68	67.7	05.9	18	117.6	10.3	68	167.4	14.6	18	217.2	19 0	68	267.0	23.3
19	18.9	01.7	69	68.7	06.0	19	118.5	10.4	69	168.4	14.7	19	218.2	19.1	69	268.0	23.4
20	19.9	01.7	70	69.7	06.1	20	119.5	10.4	70	169.4	14.8	20	219.2	19.1	70	269.0	23.5
21	20 9	01 8	71	70.7	06.2	121	120.5	10.5	171	170.4	14.9	221	220.2	19.2	271	270.0	23.6
22	21.9	01.9	72	71.7	06.3	22	121.5	10.6	72	171.3	15,0	22	221.2	19.3	72	271.0	23.7
23	22.9	02.0	73	72.7	06.4	23	122.5	10.7	73	172.3	15.1	23	222.2	19.4	73	272.0	23.8
24	23.9	02.1	74	73.7	06.5	24	123.5	10.8	74	173.3	15.1	24	223.1	19.5	74	273.0	23.8
25	24.9	02.2	75	74.7	06.5	25	124,5	10.9	75	174.3	15.2	25	224.1	19.6	75	274.0	23.9
26	25.9	02.3	76	75.7	06.6	126	125.5	11.0	176	175.3	15'3	226	225.1	19.7	276	275.0	24.0
27	26.9	02.4	77	76.7	06.7	27	126.5	11.0	77	176.3	15.4	27	226.1	19.7	77	275.9	24.1
28	27.9	02'4	78	77.7	06.8	28	127.5	11.1	78	177.3	15.5	28	227.1	19.8	78	276.9	24.2
29	28.9	02.5	79	78.7	06.9	29	128.5	11.2	79	178.3	15.6	29	228.1	19.9	79	277.9	24.3
30	29.9	02.6	80	79.7	07.0	30	129.5	11.3	80	179.3	15.7	30	229.1	20.0	80	278.9	24.4
31	30.9	02.7	81	80.7	07.1	131	130.5	11.4	181	180.3	15.7	231	230.1	20.1	281	279.9	24.4
32	31.9	02.8	82	81.7	07.2	32	131.5	11.5	82	181.3	15.8	32	231.1	20.2	82	280.9	24.5
33	32.9	03.9	83	82.7	07.2	33	132.5	11.6	83	182.3	15.9	33	232.1	20.3	83	281.9	24.6
34	33.9	03.0	84	83.7	07.3	34	133.5	11.7	84	183.3	16.0	34	253.1	20.4	84	282.9	24.7
35	34.9	03.1	85	84.7	07.4	35	134.5	11.7	85	184.3	16.1	35	234.1	20.4	85	283.9	24.8
36	35.9	03.1	86	85.7	07.5	136	135.5	11.8	186	185.3	16.2	236	235.1	20.5	286	284.9	24.9
37	36.9	03.2	87	86.7	07.6	37	136.5	11,9	87	186,3	16.3	37	236.1	20.6	87	285.9	25.0
38	37.9	03.3	88	87.7	07.7	38	137.5	12.0	88	187.3	16.4	38	237.1	20.7	88	286.9	25.1
39	38.9	03.4	89	88.7	07'8	39	138.5	12.1	89	188.3	16.4	39	238.1	20.8	89	287.9	25.1
40	39.8	03.5	90	89.7	07.8	40	139.5	12.2	90	189.3	16.5	40	239.1	20.9	90	288.9	25.2
41	40.8	03.6	91	90.7	07.9	141	140,5	12.3	191	190.3	16.6	241	240.1	21.0	291	289.9	25.3
42	41.8	03.7	92	91.6	08.0	42	141.5	12.4	92	191.3	16.7	42	241.1	21.1	92	290.9	25.4
43	42.8	03.8	93	92.6	08.1	43	142.5	12.4	93	192.3	16.8	43	242.1	21.1	93	291.9	25.5
44	43.8	03.8	94	93.6	08.2	44	143.5	12.5	94	193.3	16.9	44	243.1	21.2	94	292.9	25.6
45	44.8	03.9	95	94.6	08.3	45	144.4	12.6	95	194.3	17.0	45	244.1	21.3	95	293.9	25.7
46	45.8	04.0	96	95.6	08.4	146	145.4	12.7	196	195.3	17.1	246	245.1	21.4	296	294.9	25.8
47	46.8	04.1	97	96,6	08.5	47	146.4	12.8	97	196.3	17.1	47	246,1	21.5	97	295.9	25.8
48	47.8	04.2	98	97.6	08.5	48	147.4	12.9	98	197.2	17.2	48	247.1	21.6	98	296.9	25.9
49	48.8	04.3	99	98.6	08.6	49	148,4	13.0	99	198.2	17.3	49	248.1	21.7	99	297.9	25.0
50	49.8	04.4	100	99.6	08.7	50	149.4	13.1	200	199.2	17.4	50	249.1	21.8	300	298,9	26.1
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat.

Difference of Latitude and Departure for 6 Deg.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep
1	01.0	00.1	51	50.7	05.3	101	100.4	10.6	151	150.2	15.8	201	199.9	21.0	251	249.6	26.2
2	02.0	00.2	52	51.7	05.4	02	101.4	10.7	52	151.2	15.9	02	200.9	21.1	52	250,6	26.3
3	03.0	00.3	53	52.7	05.5	03	102.4	10.8	53	152.2	16.0	03	201.9	21.2	53	251.6	26.4
4	04.0	00.4	54	53.7	05.6	04	103.4	10.9	54	153.2	16.1	04	202.9	21.3	54	252.6	26.5
5	05.0	00.5	55	54.7	05.7	05	104.4	11.0	55	154.1	16.2	05	203.9	21.4	55	253.6	26.6
6	06.0	00.6	56	55.7	05.9	106	105.4	11.1	156	155.1	16.3	206	204.9	21.5	256	254.6	26.8
7	07.0	00.7	57	56.7	06.0	07	106.4	11.2	57	156.1	16.4	07	205.9	21.6	57	255.6	26.9
8	08,0	00.8	58	57.7	06.1	08	107.4	11.3	58	157.1	16.5	08	206,9	21.7	58	256.6	27.0
9	08,9	00.9	59	58.7	06.2	09	108.4	11.4	59	158.1	16.6	09	207.9	21.8	59	257.6	27.1
10	09.9	01.0	60	59.7	06.3	10	109.4	11.5	60	159.1	16.7	10	208.8	21.9	60	258.6	27.2
11	10.9	01.1	61	60.7	06.4	111	110.4	11.6	161	160.1	16.8	211	209.8	22 0	261	259.6	27.3
12	11.9	01.3	62	61.7	06.5	12	111.4	11.7	62	161.1	16.9	12	210.8	22.2	62	260.6	27.4
13	12.9	01.4	63	62.7	06.6	13	112.4	11.8	63	162.1	17.0	13	211.8	22.3	63	261.6	27.5
14	13.9	01.5	64	63.6	06.7	14	113.4	11.9	64	163.1	17.1	14	212.8	22.4	64	262,5	27.6
15	14.9	01.6	65	64.6	06.8	15	114.4	12.0	65	164.1	17.2	15	213.8	22.5	65	263.5	27.7
16	15.9	01.7	66	65.6	06.9	116	115.4	12.1	166	165.1	17.3	216	214.8	22.6	266	264.5	27.8
17	16.9	01.8	67	66.6	07.0	17	116.4	12.2	67	166.1	17.5	17	215.8	22.7	67	265.5	27.9
18	17.9	01.9	68	67.6	07.1	18	117.4	12.3	68	167.1	17.6	18	216.8	22.8	68	266.5	28.0
19	18.9	02.0	69	68.6	07.2	19	118.3	12.4	69	168.1	17.7	19	217.8	22.9	69	267.5	28.1
20	19.9	02.1	70	69.6	07.3	20	119.3	12.5	70	169.1	17.8	20	218.8	23.0	70	268.5	28.2
21	20.9	02.2	71	70.6	07.4	121	120.3	12.6	171	170.1	17.9	121	219.8	23.1	271	269.5	28.3
22	21.9	02.3	72	71.6	07.5	22	121.3	12.7	72	171.1	18.0	22	220.8	23.2	72	270.5	28.4
23	22.9	02.4	73	72.6	07.6	23	122.3	12.9	73	172.0	18.1	23	221.8	23.3	73	271.5	28.5
24	23.9	02.5	74	73.6	07.7	24	123.3	13.0	74	173.0	18.2	24	222.8	23.4	74	272.5	28.6
25	24.9	02.6	75	74.6	07.8	25	124.3	13.1	75	174.0	18.3	25	223.8	23.5	75	273.5	28.7
26	25.9	02.7	76	75.6	07.9	126	125.3	13.2	176	175.0	18.4	226	224.8	23.6	276	274.5	28.8
27	26.9	02.8	77	76.6	08.0	27	126.3	13.3	77	176.0	18.5	27	225.8	23.7	77	275,5	28.9
28	27.8	02.9	78	77.6	08.1	28	127.3	13.4	78	177.0	18.6	28	226.7	23.8	78	276.5	29.1
29	28.8	03.0	79	78.6	08.3	29	128.3	13.5	79	178.0	18.7	29	227.7	23.9	79	277.5	29.2
30	29.8	03.1	80	79.6	08.4	30	129.3	13.6	80	179.0	18.8	30	228.7	24.0	80	278.5	29.3
31	30.8	03.2	81	80.6	08.5	131	130.3	13.7	181	180.0	18.9	231	229.7	24.1	281	279.5	29.4
32	31.8	03.3	82	81.5	08.6	32	131.3	13.8	82	181.0	19.0	32	230,7	24.2	82	280.4	29.5
33	32.8	03.4	83	82.5	08.7	33	132.3	13.9	83	182.0	19.1	33	231.7	24.3	83	281.4	29.6
34	33.8	03.6	84	83.5	08.8	34	133.3	14.0	84	183.0	19.2	34	232.7	24.5	84	282.4	29.7
35	34.8	03.7	85	84.5	08.9	35	134.3	14.1	85	184.0	19.3	35	233.7	24.6	85	283.4	29.8
36	35.8	03.8	86	85.5	09.0	136	135.3	14.2	186	185.0	19.4	236	234.7	24.7	286	284.4	29.9
37	36.8	03.9	87	86.5	09.1	37	136.2	14.3	87	186.0	19.5	37	235.7	24.8	87	285.4	30.0
38	37.8	04.0	88	87.5	09.2	38	137.2	14.4	88	187.0	19.6	38	236.7	24.9	88	286.4	30.1
39	38.8	04.1	89	88.5	09.3	39	138.2	14.5	89	188.0	19.8	39	237.7	25.0	89	287.4	30.2
40	39.8	04.2	90	89.5	09.4	40	139.2	14.6	90	189.0	19.9	40	238.7	25.1	90	288.4	30.3
41	40.8	04.3	91	90.5	09.5	141	140.2	14.7	191	189.9	20.0	241	239.7	25.2	291	289.4	30.4
42	41.8	04.4	92	91.5	09.6	42	141.2	14.8	92	190.9	20.1	42	240.7	25.3	92	290.4	30.5
43	42.8	04.5	93	92.5	09,7	43	142.2	14.9	93	191.9	20.2	43	241.7	25.4	93	291.4	30.6
44	43,8	04.6	94	93.5	09.8	44	143.2	15.0	94	192.9	20.3	44	242.7	25.5	94	292.4	30.7
45	44.8	04.7	95	94.5	09.9	45	144.2	15.2	95	193.9	20.4	45	243.7	25.6	95	293.4	30.8
46	45.7	04.8	96	95.5	10.0	146	145.2	15.3	196	194.9	20.5	246	244.6	25.7	296	294.4	30.9
47	46.7	04.9	97	96.5	10.1	47	146.2	15.4	97	195.9	20.6	47	245.6	25 8	97	295.4	31.0
48	47.7	05.0	98	97.5	10.2	48	147.2	15.5	98	196.9	20.7	48	246.6	25.9	98	296.4	31.1
49	48.7	05.1	99	98.5	10.3	49	148.2	15.6	99	197.9	20.8	49	247.6	26.0	99	297.4	31.2
50	49.7	05.2	100	99.5	10.5	150	149.2	15.7	200	198.9	20.9	250	248.6	26.1	300	298.4	31.4
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

for 84 Deg.

Dist	Lat	Dep	Dist	La	Dep	Dist	La	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	01.0	00.1	51	50.6	06.2	101	100.2	12.3	151	149.9	18.4	201	199.5	24.5	251	249.1	30.6
2	02.0	00.2	52	51.6	06.3	02	101.2	12.4	52	150.9	18.5	02	200.5	24.6	52	250,1	30.7
3	03.0	00.4	53	52.6	06.5	03	102.2	12.5	53	151.9	18.6	03	201.5	24.7	53	251.1	30.8
4	04.0	00.5	54	53.6	06.6	04	103.2	12.7	54	152.8	18.7	04	202.5	24.8	54	252.1	30.9
5	05.0	00.6	55	54.6	06.7	05	104.2	12.8	55	153.8	18.9	05	203.5	25.0	55	253.1	31.0
6	06.0	00.7	56	55.6	06.8	106	105.2	12.9	156	154.8	19.0	206	204.5	25.1	256	254.1	31.2
7	06.9	00.9	57	56.6	06.9	07	106.2	13.0	57	155.8	19.1	07	205.4	25,2	57	255.1	31.3
8	07.9	01.0	58	57.6	07.1	08	107.2	13.1	58	156.8	19.2	08	206.4	25.3	58	256.1	31.4
9	08.9	01.1	59	58.6	07.2	09	108.2	13.3	59	157.8	19.4	09	207.4	25.4	59	257.1	31.5
10	09.9	01.2	60	59.6	07.3	10	109.2	13.4	60	158.8	19.5	10	208.4	25.6	60	258.1	31.7
11	10.9	01.3	61	60.5	07.4	111	110.2	13.5	161	159.8	19.6	211	209.4	25.7	261	259.0	31.8
12	11.9	01.5	62	61.5	07.5	12	111.2	13.6	62	160.8	19.7	12	210.4	25.8	62	260.0	31.9
13	12.9	01.6	63	62.5	07.7	13	112.2	13.8	63	161.8	19.8	13	211.4	25.9	63	261.0	32,0
14	13.9	01.7	64	63.5	07.8	14	113.1	13.9	64	162.8	20.0	14	212.4	26.1	64	262.0	32.1
15	14.9	01.8	65	64.5	07.9	15	114.1	14,0	65	163 8	20.1	15	213.4	26.2	65	263,0	32.3
16	15.9	01.9	66	65.5	08.0	116	115.1	14.1	166	164,8	20.2	216	214.4	26.3	266	264.0	32.4
17	16.9	02.1	67	66.5	08.2	17	116.1	14.2	67	165.7	20.3	17	215.4	26.4	67	265.0	32.5
18	17.9	02.2	68	67.5	08.3	18	117.1	14.4	68	166.7	20.5	18	216.4	26.5	68	266.0	32.6
19	18.9	02.3	69	68.5	08.4	19	118.1	14.5	69	167.7	20.6	19	217.4	26.7	69	267.0	32.8
20	19.9	02.4	70	69.5	08.5	20	119.1	14.6	70	168.7	20.7	20	218.4	26.8	70	268.0	32.9
21	20.8	02.6	71	70.5	08.6	121	120.1	14.7	171	169.7	20.8	221	219.3	26.9	271	269.0	33.0
22	21.8	02.7	72	71.5	08.8	22	121.1	14.9	72	170.7	20.9	22	220.3	27.0	72	270.0	33.1
23	22.8	02.8	73	72.5	08.9	23	122.1	15.0	73	171.7	21.1	23	221,3	27.2	73	271.0	33.2
24	23.8	02.9	74	73.4	09.0	24	123.1	15.1	74	172.7	21.2	24	222.3	27.3	74	271.9	33.4
25	24.8	03.0	75	74.4	09.1	25	124.1	15.2	75	173.7	21.3	25	223.3	27.4	75	272.9	33.5
26	25.8	03.2	76	75.4	09.3	126	125.1	15.3	176	174.7	21.4	226	224.3	27.5	276	273.9	33.6
27	26.8	03.3	77	76.4	09.4	27	126.0	15.5	77	175.7	21.6	27	225.3	27.6	77	274.9	33.7
28	27.8	03.4	78	77.4	09.5	28	127.0	15.6	78	176.7	21.7	28	226.3	27.8	78	275.9	33.9
29	28.8	03.5	79	78.4	09.6	29	128.0	15.7	79	177.7	21.8	29	227.3	27.9	79	276.9	34.0
30	29.8	03.7	80	79.4	09.7	30	129.0	15.8	80	178.7	21.9	30	228.3	28.0	80	277.9	34.1
31	30.8	03.8	81	80.4	09.9	131	130.0	16.0	181	179.6	22.0	231	229,3	28.1	281	278.9	34.2
32	31.8	03.9	82	81.4	10.0	32	131.0	16.1	82	180.6	22.2	32	230.3	28.3	82	279.9	34.3
33	32.8	04.0	83	82.4	10.1	33	132.0	16.2	83	181.6	22.3	33	231.3	28.4	83	280.9	34.5
34	33.7	04.1	84	83.4	10.2	34	133.0	16.3	84	182.6	22.4	34	232.2	28.5	84	281.9	34.6
35	34.7	04.3	85	84.4	10.4	35	134.0	16.4	85	183.6	22.5	35	233.2	28.6	85	282.9	34.7
36	35.7	04.4	86	85.4	10.5	136	135.0	16.6	186	184.6	22.7	236	234.2	28,7	286	283.9	34.8
37	36.7	04.5	87	86.3	10.6	37	136.0	16.7	87	185.6	22.8	37	235.2	28.9	87	284.8	34.9
38	37.7	04.6	88	87.3	10.7	38	137.0	16.8	88	186.6	22.9	38	236.2	29.0	88	285.8	35.1
39	38.7	04.8	89	88.3	10.8	39	138.0	16.9	89	187.6	23.0	39	237.2	29.1	89	286.8	35.2
40	39.7	04.9	90	89.3	11.0	40	139.0	17.1	90	188.6	23.1	40	238.2	29.2	90	287.8	35.3
41	40.7	05.0	91	90.3	11.1	141	139.9	17.2	191	189.6	23.3	241	239.2	29.3	291	288.8	35.4
42	41.7	05.1	92	91.3	11.2	42	140.9	17.3	92	190.6	23.4	42	240.2	29.5	92	289.8	35.5
43	42.7	05.2	93	92.3	11.3	43	141.9	17.4	93	191.6	23.5	43	241.2	29.6	93	290.8	35.7
44	43.7	05.4	94	93.3	11.5	44	142.9	17.5	94	192.5	23.6	44	242.2	29.7	94	291.8	35.8
45	44.7	05.5	95	94 3	11.6	45	143.9	17.7	95	193.5	23.7	45	243.2	29.8	95	292.8	35,9
46	45.7	05.6	96	95.3	11.7	146	144.9	17.8	196	194.5	23.9	246	244.2	29.9	296	293.8	36.0
47	46.6	05.7	97	96.3	11.8	47	145.9	17.9	97	195.5	24.0	47	245.1	30.1	97	294.8	36.2
48	47.6	05.8	98	97.3	11.9	48	146.9	18.0	98	196.5	24.1	48	246.1	30.2	98	295.8	36.3
49	48.6	06.0	99	98.3	12.1	49	147.9	18.1	99	197.5	24.2	49	147.1	30.3	99	296.8	36.4
50	49.6	06.1	100	99.3	12.2	150	148.9	18.5	200	198.5	24.3	250	248.1	30.4	300	297.8	36.5
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	01.0	00.1	51	50.5	07.1	101	100.0	14.1	151	149.5	21.0	201	199.1	28.0	251	248.6	34.9
2	02.0	00.3	52	51.5	07.2	02	101.0	14.2	52	150.5	21.2	02	200.0	28.1	52	249.6	35.1
3	03.0	00.4	53	52.5	07.4	03	102.0	14.3	53	151.5	21.3	03	201.0	28.3	53	250.5	35.2
4	04.0	00.6	54	53.5	07.5	04	103.0	14.5	54	152.5	21.4	04	202.0	28.4	54	251.5	35.4
5	05.0	00.7	55	54.5	07.7	05	104.0	14.6	55	153.5	21.6	05	203.0	28.5	55	252.5	35.5
6	05.9	00.8	56	55.5	07.8	106	105.0	14.8	156	154.5	21.7	206	204.0	28.7	256	253.5	35.6
7	06.9	01.0	57	56.4	07.9	07	106.0	14.9	57	155.5	21.9	07	205.0	28.8	57	254.5	35.8
8	07.9	01.1	58	57.4	08.1	08	107.0	15.0	58	156.5	22.0	08	206.0	29.0	58	255.5	35.9
9	08.9	01.3	59	58.4	08.2	09	107.9	15.2	59	157.5	22.1	09	207.0	29.1	59	256.5	36.1
10	09.9	01.4	60	59.4	08.4	10	108.9	15.3	60	158.4	22.3	10	208.0	29.2	60	257.5	36.2
11	10.9	01.5	61	60.4	08.5	111	109.9	15.5	161	159.4	22.4	211	209.0	29.4	261	258.5	36.3
12	11.9	01.7	62	61.4	08.6	12	110.9	15.6	62	160.4	22.6	12	209.9	29.5	62	259.5	36.5
13	12.9	01.8	63	62.4	08.8	13	111.9	15.7	63	161.4	22.7	13	210.9	29.6	63	260.4	36.6
14	13.9	01.9	64	63.4	08.9	14	112.9	15.9	64	162.4	22.8	14	211.9	29.8	64	261.4	36.7
15	14.9	02.1	65	64.4	09.0	15	113.9	16.0	65	163 4	23.0	15	212.9	29.9	65	262.4	36.9
16	15.8	02.2	66	65.4	09.2	116	114.9	16.1	166	164,4	23.1	216	213.9	30.1	266	263.4	37.0
17	16.8	02.4	67	66.4	09.3	17	115.9	16.3	67	165.4	23.2	17	214.9	30.2	67	264.4	37.2
18	17.8	02.5	68	67.3	09.5	18	116.9	16.4	68	166.4	23.4	18	215.9	30.3	68	265.4	37.3
19	18.8	02.6	69	68.3	09.6	19	117.8	16.6	69	167.4	23.5	19	216.9	30.5	69	266.4	37.4
20	19.8	02.8	70	69.3	09.7	20	118.8	16.7	70	168.4	23.7	20	217.9	30.6	70	267.4	37.6
21	20.8	02.9	71	70.3	09 9	121	119.8	16.8	171	169.3	23.8	221	218.9	30.8	271	268.4	37.7
22	21.8	03.1	72	71.3	10.0	22	120.8	17.0	72	170.3	23.9	22	219.8	30.9	72	269.4	37.9
23	22.8	03.2	73	72.3	10.2	23	121.8	17.1	73	171.3	24.1	23	220.8	31.0	73	270.4	38.0
24	23.8	03.3	74	73.3	10.3	24	122.8	17.3	74	172.3	24.2	24	221,8	31.2	74	271.3	38.1
25	24.8	03.5	75	74.3	10.4	25	123.8	17.4	75	173.3	24.4	25	222.8	31.3	75	272.3	38.3
26	25.7	03.6	76	75.3	10.6	126	124.8	17.5	176	174.3	24.5	226	223.8	31.5	276	273.3	38.4
27	26.7	03.8	77	76.3	10.7	27	125.8	17.7	77	175.3	24.6	27	224.8	31.6	77	274.3	38.6
28	27.7	03.9	78	77.2	10.9	28	126.8	17.8	78	176.3	24.8	28	225.8	31.7	78	275.3	38.7
29	28.7	04.0	79	78.2	11.0	29	127.7	18.0	79	177.3	24.9	29	226.8	31.9	79	276.3	38.8
30	29.7	04.2	80	79.2	11.1	30	128.7	18.1	80	178.3	25.1	30	227.8	32,0	80	277.3	39.0
31	30.7	04.3	81	80.2	11.3	131	129.7	18.2	181	179.2	25.2	231	228.8	32.2	281	278.3	39.1
32	31.7	04.5	82	81.2	11.4	32	130.7	18.4	82	180.2	25,3	32	229,7	32.3	82	279.3	39.3
33	32.7	04.6	83	82.2	11.6	33	131.7	18.5	83	181.2	25.5	33	230.7	32.4	83	280.3	39.4
34	33.7	04.7	84	83.2	11.7	34	132.7	18.7	84	182.2	25.6	34	231.7	32.6	84	281.2	39.5
35	34.7	04.9	85	84.2	11.8	35	133.7	18.8	85	183.2	25.8	35	232.7	32.7	85	282.2	39.7
36	35.7	05.0	86	85.2	12.0	136	134.7	18.9	186	184.2	25.9	236	233.7	32.9	286	283.2	39.8
37	36.6	05.2	87	86.2	12.1	37	135.7	19.1	87	185.2	26.0	37	234.7	33.0	87	284.2	40.0
38	37.6	05.3	88	87.1	12.2	38	136.7	19.2	88	186.2	26.2	38	235.7	33.1	88	285.2	40.1
39	38.6	05.4	89	88.1	12.4	39	137.7	19.3	89	187.2	26.3	39	236.7	33.3	89	286.2	40.2
40	39.6	05.6	90	89.1	12.5	40	138.6	19.5	90	188.2	26.4	40	237.7	33.4	90	287.2	40.4
41	40.6	05.7	91	90.1	12.7	141	139.6	19.6	191	189.1	26.6	241	238.7	33.5	291	288.2	40.5
42	41.6	05.8	92	91.1	12.8	42	140.6	19.8	92	190.1	26.7	42	239.7	33.7	92	289.2	40.6
43	42.6	06.0	93	92.1	12.9	43	141.6	19.9	93	191.1	26.9	43	240.6	33.8	93	290.2	40.8
44	43.6	06.1	94	93.1	13.1	44	142.6	20.0	94	192.1	27.0	44	241.6	34.0	94	291.1	40.9
45	44.6	06.3	95	94.1	13.2	45	143.6	20.2	95	193.1	27.1	45	242.6	34.1	95	292.1	41.1
46	45.6	06.4	96	95.1	13.4	146	144.6	20.3	196	194.1	27.3	246	243.6	34.2	296	293.1	41.2
47	46.5	06 5	97	96.1	13.5	47	145.6	20.5	97	195.1	27.4	47	244.6	34.4	97	294.1	41.3
48	47.5	06.7	98	97.0	13.6	48	146.6	20.6	98	196.1	27.6	48	245.6	34.5	98	295.1	41.5
49	48.5	06.8	99	98.0	13.8	49	147.6	20.7	99	197.1	27.7	49	246.6	34.7	99	296.1	41.6
50	49.5	07.0	100	99.0	13.9	150	148.6	20.9	200	198.1	27.8	250	147.6	34.8	300	297.1	41.8
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	01.0	00.2	51	50.4	08.0	101	99.8	15,8	151	149.1	23.6	201	198.5	31.4	251	247.9	39.3
2	02.0	00.3	52	51.4	08.1	02	100.7	16.0	52	150.1	23.8	02	199.5	31.6	52	248.9	39,4
3	03.0	00.5	53	52.3	08.3	03	101.7	16.1	53	151.1	23.9	03	200.5	31.7	53	249.9	39.6
4	04.0	00.6	54	53.3	08.4	04	102.7	16.3	54	152.1	24.1	04	201.5	31.9	54	250.9	39.7
5	04.9	00.8	55	54.3	08.6	05	103.7	16.4	55	153.1	24.2	05	202.5	32.1	55	251.9	39.9
6	05.9	00.9	56	55,3	06.8	106	104.7	16,6	156	154.1	24.4	206	203.5	32.2	256	252.9	40.0
7	06.9	01.1	57	56.3	08.9	07	105.7	16 7	57	155.1	24.6	07	204.5	32.4	57	253.8	40.2
8	07.9	01.3	58	57.3	09.1	08	106.7	16.9	58	156.1	24.7	08	205.4	32.5	58	254.8	40.4
9	08.9	01.4	59	58.3	09.2	09	107.7	17.0	59	157.0	24.9	09	206.4	32.7	59	255 8	40 5
10	09 9	01.6	60	59.3	09.4	10	108.6	17.2	60	158.0	25.0	10	207.4	32.8	60	256.8	40.7
11	10.9	01.7	61	60.2	09.5	111	109.6	17.4	161	159.0	25.2	211	208.4	33.0	261	257.8	40,8
12	11.9	01.9	62	61,2	09.7	12	110.6	17.5	62	160.0	25.3	12	209.4	33.2	62	258.8	41.0
13	12.8	02.0	63	62.2	09.9	13	111.6	17.7	63	161.0	25.5	13	210.4	33.3	63	259.8	41.1
14	13.8	02.2	64	63.2	10.0	14	112.6	17.8	64	162.0	25.6	14	211.4	33.5	64	260,8	41.3
15	14.8	02.3	65	64.2	10.2	15	113.6	18.0	65	163.0	25.8	15	212.4	33.6	65	261.7	41.4
16	15.8	02.5	66	65.2	10.3	1 6	114.6	18,1	166	164.0	26.0	216	213.3	33.8	266	262.7	41.6
17	16.8	02.7	67	66.2	10.5	17	115.6	18.3	67	164.9	26.1	17	214.3	33.9	67	263.7	41.8
18	17.8	02.8	68	67.2	10.6	18	116.5	18.5	68	165.9	26.3	18	215.3	34.1	68	264.7	41.9
19	18.8	03.0	69	68.2	10.8	19	117.5	18.6	69	166.9	26.4	19	216.3	34.3	69	265.7	42.1
20	19 8	03.1	70	69.1	10.9	20	118.5	18.8	70	167.9	26.6	20	217.3	34.4	70	266.7	42.2
21	20 7	03.3	71	70.1	11.1	121	119.5	18.9	171	168.9	26.7	221	218.3	34.6	271	267.7	42.4
22	21.7	03.4	72	71.1	11.3	22	120.5	19.1	72	169.9	26.9	22	219.3	34.7	72	268.7	42.5
23	22.7	03.6	73	72.1	11.4	23	121.5	19.2	73	170.9	26.1	23	220.3	34.9	73	269.6	42.7
24	23.7	03.8	74	73.1	11.6	24	122.5	19.4	74	171.9	27.2	24	221.2	35.0	74	270.6	42.9
25	24.7	03.9	75	74.1	11.7	25	123.5	19.6	75	172.8	27.4	25	222.2	35.2	75	271.6	43.0
26	25.7	04.1	76	75.1	11.9	126	124,5	19.7	176	173.8	27.5	226	223.2	35.3	276	272.6	43.2
27	26.7	04.2	77	76.1	12.0	27	125.4	19.9	77	174.8	27.7	27	224.2	35.5	77	273.6	43.3
28	27.7	04.4	78	77.0	12.2	28	126.4	20.0	78	175.8	27.8	28	225.2	35.7	78	274.6	43.5
29	28.6	04.5	79	78.0	12.4	29	127.4	20.2	79	176.8	28.0	29	226.2	35.8	79	275.6	43.6
30	29.6	04.7	80	79.0	12.5	30	128.4	20.3	80	177.8	28.2	30	227.2	36.0	80	276.6	43.8
31	30.6	04.8	81	80.0	12.7	131	129.4	20.5	181	178.8	28.3	231	228.2	36.1	281	277.5	43,9
32	31.6	05.0	82	81.0	12.8	32	130.4	20.6	82	179.8	28,5	32	229.1	36.3	82	278.5	44.1
33	32.6	05.2	83	82.0	13.0	33	131.4	20.8	83	180.7	28.6	33	230.1	36.4	83	279.5	44.3
34	33.6	05.3	84	83.0	13.1	34	132.4	21.0	84	181.7	28.8	34	231.1	36.6	84	280.5	44.4
35	34.6	05.5	85	84.0	13.3	35	133.3	21.1	85	182.7	28.9	35	232.1	36.8	85	281.5	44 6
36	35.6	05.6	86	84.9	13.5	136	134.3	21.3	186	183.7	29.1	236	253.1	36.9	286	282.5	44.7
37	36.5	05.8	87	85.9	13.6	37	135.3	21.4	87	184.7	29.2	37	234.1	37.1	87	283.5	44.9
38	37.5	05.9	88	86.9	13.8	38	136.3	21.6	88	185.7	29.4	38	235.1	37.2	88	284.5	45.0
39	38.5	06.1	89	87.9	13.9	39	137.3	21.7	89	186,7	29.6	39	236.1	37.4	89	285.4	45.2
40	39.5	06.3	90	88.9	14.1	40	138.3	21.9	90	187.7	29.7	40	237.0	37.5	90	286.4	45.4
41	40.5	06.4	91	89.9	14.2	141	139.3	22.1	191	188.7	29.9	241	238.0	37.7	291	287.4	45.5
42	41.5	06.6	92	90.9	14.4	42	140,3	22.2	92	189.6	30.0	42	239.0	37.8	92	288.4	45.7
43	42.5	06.7	93	91.9	14.5	43	141.2	22.4	93	190.6	30.2	43	240.0	38.0	93	289.4	45.8
44	43.5	06.9	94	92.8	14.7	44	142.2	22.5	94	191.6	30.3	44	241.0	38.2	94	290.4	46.0
45	44.4	07.0	95	93.8	14.9	45	143.2	22.7	95	192.6	30.5	45	242.0	38.3	95	291 4	46.1
46	45.4	07.2	96	94.8	15,0	146	144.2	22.8	196	193.6	30.7	246	243.0	38.5	296	292.4	46.3
47	46.4	07.4	97	95.8	15.2	47	145.2	23.0	97	194.6	30.8	47	244.0	38.6	97	293.3	46.5
48	47.4	07.5	98	96,8	15.3	48	146.2	23.1	98	195.6	31.0	48	244.9	38.8	98	294.3	46.6
49	48.4	07.7	99	97.8	15.5	49	147.2	23.3	99	196.6	31.1	49	245.9	38.9	99	295.3	46.8
50	49.4	07.8	100	98.8	15.6	50	148.2	23.5	200	197.5	31.3	50	246.9	39.1	300	296.3	46.9
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat.

for 81 Deg.

Difference of Latitude and Departure for 10 Deg.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	01.0	00.2	51	50.2	08.8	101	99.5	17.5	151	148.7	26.2	201	197.9	34.9	251	247.2	43.5
2	02.0	00.3	52	51.2	09.0	02	100.4	17.7	52	149.7	26.4	02	198.9	35.0	52	248.2	43.7
3	03.0	00.5	53	52.2	09.2	03	101.4	17.9	53	150.7	26.5	03	199.9	35.2	53	249.2	43.9
4	03.9	00.7	54	53.2	09.4	04	102.4	18.0	54	151.7	26.7	04	200.9	35.4	54	250.1	44.0
5	04.9	00.9	55	54.2	09.5	05	103.4	18.2	55	152.6	26.9	05	201.9	35.5	55	251.1	44.2
6	05.9	01.0	56	55.1	09.7	106	104.4	18.4	156	153.6	27.1	206	202.9	35.7	256	252.1	44.4
7	06.9	01.2	57	56.1	09.9	07	105.4	18.6	57	154.6	27.2	07	203.9	35.9	57	253.1	44.6
8	07.9	01.4	58	57.1	10.1	08	106.4	18.7	58	155.6	27.4	08	204.8	36.1	58	255.1	44.7
9	08.9	01.6	59	58.1	10.2	09	107.3	18.9	59	156.6	27.6	09	205.8	36.2	59	255.1	44.9
10	09.9	01.-	60	59.1	10.4	10	108.3	19.1	60	157.6	27.7	10	206.8	36.4	60	256.0	45.1
11	10.8	01.9	61	60.1	10.6	111	109.3	19.2	161	158.6	27.9	211	207.8	36.6	261	257.0	45.3
12	11.8	02.1	62	61.1	10.8	12	110.3	19.4	62	159.5	28.1	12	208.8	36.8	62	258.0	45.4
13	12.8	02.3	63	62.0	10.9	13	111.3	19.6	63	160.5	28.3	13	209.8	36.9	63	259.0	45.6
14	13.8	02.4	64	63.0	11.1	14	112.3	19.8	64	161.5	28.4	14	210.7	37.1	64	260.0	45.8
15	14.8	02.6	65	64.0	11.2	15	113.3	19.9	65	162.5	28.6	15	211.7	37.3	65	261.0	46.0
16	15.8	02.8	66	65.0	11.4	116	114.2	20.1	166	163 5	28.8	216	212.7	37.5	266	262.0	46.1
17	16.7	02.9	67	66.0	11.6	17	115.2	20.3	67	164,5	29.0	17	213.7	37.6	67	262.9	46.3
18	17.7	03.1	68	67.0	11.8	18	116.2	20.5	68	165.4	29.1	18	214.7	37.8	68	263,9	46.5
19	18.7	03.3	69	68.0	12.0	19	117.2	20.6	69	166.4	29.3	19	215.7	38.0	69	264.9	46.6
20	19.7	03.5	70	68.9	12.1	20	118.2	20.8	70	167.4	29.5	20	216.7	38.1	70	265.9	46.8
21	20.7	03.6	71	69.9	12.3	121	119.2	21.0	171	168.4	29.7	221	217.6	38.3	271	266.9	47.0
22	21.7	03.8	72	70.9	12.5	22	120.1	21.2	72	169.4	29.8	22	218.6	38.5	72	267.9	47.2
23	22.6	04.0	73	71.9	12.7	23	121.1	21.3	73	170.4	30.0	23	219.6	38.7	73	268.8	47.3
24	23.6	04.2	74	72.9	12.8	24	122.1	21.5	74	171.4	30,2	24	220.6	38.8	74	269.8	47.5
25	24.6	04.3	75	73.9	13.0	25	123.1	21.7	75	172.3	30.3	25	221,6	39.0	75	270.8	47.7
26	25.6	04.5	76	74.8	13.2	126	124.1	21.8	176	173.3	30.5	226	222.6	39.2	276	271.8	47.9
27	26.6	04.7	77	75.8	13.4	27	125.1	22.0	77	174.3	30.7	27	223.5	39.4	77	272.8	48.0
28	27.6	04.9	78	76.8	13.5	28	126.1	22.2	78	175.3	30.9	28	224.5	39.5	78	273.8	48.2
29	28.6	05.0	79	77.8	13.7	29	127.0	22.4	79	176.3	31.0	29	225.5	39.7	79	274.8	48.4
30	29.5	05.2	80	78.8	13.9	30	128.0	22.5	80	177.3	31.2	30	226.5	39.9	80	275.7	48.6
31	30.5	05.4	81	79.8	14.0	131	129.0	22.7	181	178.2	31.4	231	227.5	40.1	281	276.7	48.7
32	31.5	05.5	82	80.8	14.2	32	130.0	22.9	82	179.2	31.6	32	228.5	40.2	82	277.7	48.9
33	32.5	05.7	83	81.7	14.4	33	131.0	23.1	83	180.2	31.7	33	229,5	40.4	83	278.7	49.1
34	33.5	05.9	84	82.7	14.6	34	132.0	23.2	84	181.2	31.9	34	230.4	40.6	84	279.7	49.2
35	34.5	06.1	85	83.7	14.7	35	132.9	23.4	85	182.2	32.1	35	231.4	40.7	85	280.7	49.4
36	35.5	06.2	86	84.7	14.9	136	133.9	23.6	186	183.2	32.3	236	232.4	40.9	286	281.6	49.6
37	36.4	06.4	87	85.7	15.1	37	134.9	23.8	87	184.2	32.4	37	233.4	41.1	87	282.6	49.8
38	37.4	06.6	88	86.7	15.3	38	135.9	23.9	88	185.1	32.6	38	234.4	41.3	88	283.6	49.9
39	38.4	06 8	89	87.6	15.4	39	136.9	24,1	89	186.1	32.8	39	235.4	41.4	89	284.6	50.1
40	39.4	06.9	90	88.6	15.6	40	137.9	24.3	90	187.1	32.9	40	236.3	41.6	90	285.6	50.3
41	40.4	07.1	91	89.6	15.8	141	138.9	24.4	191	188.1	33.1	241	237.3	41.8	291	286.6	50.5
42	41.4	07.3	92	90.6	16.0	42	139.8	24.6	92	189.1	33.3	42	238.3	42.0	92	287.6	50.6
43	42.3	07.5	93	91.6	16.1	43	140.8	24.8	93	190.1	33.5	43	239.3	42.1	93	288.5	50.8
44	43.3	07.6	94	92.6	16.3	44	141.8	25.0	94	191.0	33.6	44	240.3	42.3	94	289.5	51.0
45	44.3	07.8	95	93.6	16.5	45	142.8	25.1	95	192.0	33.8	45	241.3	42.5	95	290.5	51.2
46	45.3	08.0	96	94 5	16.6	146	143.8	25.3	196	193.0	34.0	246	242.3	42.7	296	291.5	51.3
47	46.3	08.1	97	95.5	16.8	47	144.8	25.5	97	194.0	34.2	47	243.2	42.8	97	292.5	51.5
48	47.3	08.3	98	96.5	17.0	48	145.7	25.7	98	195.0	34.3	48	244.2	43.0	98	293.5	51.7
49	48.3	08.5	99	97.5	17.2	49	146.7	25.8	99	196.0	34.5	49	245.2	43.2	99	294.5	52.8
50	49.2	08.7	100	98.5	17.3	150	147.7	26.0	200	197.0	34.7	250	246.2	43.4	300	295.4	52.0
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.

for 80 Deg.

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	01.0	00.2	51	50.1	09.7	101	99.1	19.3	151	148.2	28.8	201	197.3	38.4	251	246,4	47.9
2	02.0	00.4	52	51.0	09.9	02	100.1	19.5	52	149.2	29.0	02	198.3	38.5	52	247.4	48.1
3	02.9	00.6	53	52.0	10.1	03	101.1	19.7	53	150.2	29.2	03	199.3	38.7	53	248.3	48.3
4	03.9	00.8	54	53.0	10.3	04	102.1	19.8	54	151.2	29.4	04	200.2	38.9	54	249.3	48.5
5	04.9	01.0	55	54.0	10.5	05	103.1	20.0	55	152.1	29.6	05	201.2	39.1	55	250.3	48.7
6	05.9	01.1	56	55,0	10.7	106	104.0	20.2	156	153.1	29.8	206	202.2	39,3	256	251.3	49,8
7	06.9	01.3	57	56.0	10.9	07	105.0	20.4	57	154.1	30.0	07	203.2	39.5	57	252.3	49.0
8	07.9	01.5	58	56.9	11.1	08	106.0	20.6	58	155.1	30.1	08	204.2	39.7	58	253.2	49.2
9	08.8	01.7	59	57.9	11.3	09	107.0	20.8	59	156.1	30.3	09	205.2	39.9	59	254.2	49.4
10	09 8	01.9	60	58.9	11.4	10	108.0	21.0	60	157.1	30.5	10	206.1	40.1	60	255 2	49.6
11	10.8	02.1	61	59.9	11.6	111	109.0	21.2	161	158.0	30.7	211	207.1	40.3	261	256.2	49.8
12	11.8	02.3	62	60.9	11.8	12	109.9	21.4	62	159.0	30.9	12	208.1	40.4	62	257.2	50.0
13	12.8	02.5	63	61,8	12.0	13	110.9	21.6	63	160.0	31.1	13	209.1	40.6	63	258.2	50.2
14	13.7	02.7	64	62.8	12.2	14	111.9	21.8	64	161.0	31.3	14	210.1	40.8	64	259.1	50.4
15	14.7	02.9	65	63.8	12.4	15	112.9	21.9	65	162.0	31.5	15	211.0	41.0	65	260,1	50.6
16	15.7	03.1	66	64.8	12.6	116	113.9	22.1	166	162.9	31.7	216	212.0	41.2	266	261.1	50.8
17	16.7	03.2	67	65.8	12,8	17	114.8	22.3	67	163.9	31.9	17	213.0	41.4	67	262.1	50.9
18	17.7	03.4	68	66.7	13.0	18	115.8	22.5	68	164.9	32.1	18	214.0	41.6	68	263.1	51.1
19	18.7	03.6	69	67.7	13.2	19	116.8	22.7	69	165.9	32.2	19	115.0	41.8	69	264.0	51.3
20	19 6	03.8	70	68.7	13.4	20	117.8	22.9	70	166.9	32.4	20	215.9	42.0	70	265.0	51.5
21	20.6	04.0	71	69.7	13.5	121	118.8	23.1	171	167.9	32 6	221	216.9	42.2	271	266.0	51.7
22	21.6	04.2	72	70.7	13.7	22	119.8	23.3	72	168.8	32.8	22	217.9	42.4	72	267.0	51.9
23	22.6	04.4	73	71.7	13.9	23	120.7	23.5	73	169.8	33.0	23	218.9	42.5	73	268.0	52.1
24	23.6	04.6	74	72.6	14.1	24	121.7	23.7	74	170.8	33.2	24	219.9	42.7	74	269.0	52.3
25	24.5	04.8	75	73.6	14.3	25	122.7	23.9	75	171.8	33.4	25	220.9	42.9	75	269,9	52.5
26	25.5	05.0	76	74.6	14.5	126	123.7	24.0	176	172.8	33.6	226	221.8	43.1	276	270.9	52.7
27	26.5	05.2	77	75.6	14.7	27	124,7	24.2	77	173.7	33.8	27	222.8	43.3	77	271.9	52.9
28	27.5	05.3	78	76.6	14.9	28	125.6	24.4	78	174.7	34.0	28	223.8	43.5	78	272.9	53.0
29	28.5	05.5	79	77.5	15,1	29	126.6	24.6	79	175.7	34.2	29	224.8	43.7	79	273.9	53.2
30	29.4	05.7	80	78.5	15.3	30	127.6	24.8	80	176.7	34.3	30	225.8	43.9	80	274.8	53.4
31	30.4	05.9	81	79.5	15.5	131	128.6	25.0	181	177.7	34.5	231	226.7	44.1	281	275.8	53.6
32	31.4	06.1	82	80.5	15.6	32	129.6	25.2	82	178.6	34.7	32	227.7	44.3	82	276.8	53.8
33	32.4	06.3	83	81.5	15.8	33	130.6	25.4	83	179.6	34.9	33	228.7	44.5	83	277.8	54.0
34	33.4	06.5	84	82.5	16.0	34	131.5	25.6	84	180.6	35,1	34	229.7	44 6	84	278.8	54.2
35	34.4	06.7	85	83.4	16.2	35	132.5	25.8	85	181.6	35.3	35	230.7	44.8	85	279.8	54.4
36	35.3	06.9	86	84.4	16.4	136	133.5	26.0	186	182.6	35.5	236	231.7	45.0	286	280.7	54.6
37	36.3	07.1	87	85.4	16.6	37	134.5	26.1	87	183.6	35.7	37	232.6	45.2	87	281.7	54.8
38	37.3	07.3	88	86.4	16.8	38	135.5	26.3	88	184.5	35.9	38	253.6	45.4	88	282.7	55.0
39	38.3	07.4	89	87.4	17.0	39	136.4	26.5	89	185.5	36.1	39	234.6	45.6	89	283.7	55.1
40	39.3	07.6	90	88.3	17.2	40	137.4	26.7	90	186,5	36.3	40	235.6	45.8	90	284.7	55.3
41	40.2	07.8	91	89.3	17.4	141	138.4	26.9	191	187.5	36.4	241	236.6	46.0	291	285.6	55.5
42	41.2	08.0	92	90.3	17.6	42	139 4	27.1	92	188.5	36.6	42	237.5	46.2	92	286.6	55,7
43	42.2	08.2	93	91.3	17.7	43	140,4	27.3	93	189.4	36.8	43	238.5	46.4	93	287.6	56.9
44	43.2	08.4	94	92.3	17.9	44	141.3	27.5	94	190.4	37.0	44	239.5	46.6	94	288.6	56.0
45	44.2	08.6	95	93.3	18.1	45	142.3	27.7	95	191.4	37.2	45	240.5	46.7	95	289.6	56.3
46	45.2	68.8	96	94.2	18.3	146	143.3	27.9	196	192.4	37.4	246	241.5	47.0	296	290 5	56.5
47	46.1	09.0	97	95.2	18.5	47	144.3	28.0	97	193.4	37.6	47	242.5	47.1	97	291 5	56.7
48	47.1	09.2	98	96,2	18,7	48	145.3	28.2	98	194.4	37.8	48	243.4	47.3	98	292.5	56.9
49	48.1	09.3	99	97.2	18.9	49	146.2	28.4	99	195.4	38.0	49	244.4	47.5	99	293.5	57.0
50	49.1	09.5	100	98.2	19 1	50	147.2	28,6	200	196.3	38.2	50	245.4	47.7	300	294.5	57.2
Dist	Dep	Lat.	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.

for 79 Deg.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	01.0	00.2	51	49.9	10.6	101	98.8	21.0	151	147.7	31.4	201	196.6	41.8	251	245.5	52.2
2	02.0	00.4	52	50.9	10.8	02	99.8	21.2	52	148.7	31.6	02	197.6	42.0	52	246.5	52.4
3	02.9	00.6	53	51.8	11.0	03	100.7	21.4	53	149.6	31.8	03	198.5	42.2	53	247.4	52.6
4	03.9	00.8	54	52.8	11.2	04	101.7	21.6	54	150.6	32.0	04	199.5	42.4	54	248.4	52.8
5	04.9	01.0	55	53.8	11.4	05	102.7	21.8	55	151.6	32.2	05	200.5	42.6	55	249.4	53.0
6	05.9	01.2	56	54.8	11.6	106	103.7	22.0	156	152.6	32.4	206	201.5	42.8	256	250.4	53.2
7	06.8	01.5	57	55.7	11.9	07	104.6	22.3	57	153.5	32.7	07	202.4	43.1	57	251.3	53.5
8	07.8	01.7	58	56.7	12.1	08	105.6	22.5	58	154.5	32.9	08	203.4	43.3	58	252.3	53.7
9	08.8	01.9	59	57.7	12.3	09	106.6	22.7	59	155.5	33.1	09	204.4	43.5	59	253.3	53.9
10	09.8	02.1	60	58.7	12.5	10	107.6	22.9	60	156.5	33.3	10	205.4	43.7	60	254.3	54.1
11	10.8	02.3	61	59.7	12.7	111	108.6	23.1	161	157.5	33.5	211	206.4	43.9	261	255.3	54.3
12	11.7	02.5	62	60.6	12.9	12	109.5	23.3	62	158.4	33.7	12	207.3	44.1	62	256.2	54.5
13	12.7	02.7	63	61.6	13.1	13	110.5	23.5	63	159.4	33.9	13	208.3	44.3	63	257.2	54.7
14	13.7	02.9	64	62.6	13.3	14	111.5	23.7	64	160.4	34.1	14	209.3	44.5	64	258.2	54.9
15	14.7	03.1	65	63.6	13.5	15	112.5	23.9	65	161.4	34.3	15	210.3	44.7	65	259.2	55.1
16	15.6	03.3	66	64.5	13.7	116	113.4	24.1	166	162.3	34.3	216	211.2	44.9	266	260.1	55.3
17	16.6	03.5	67	65.5	13.9	17	114.4	24.3	67	163 3	34.7	17	212.2	45.1	67	261.1	55.5
18	17.6	03.7	68	66.5	14.1	18	115.4	24.5	68	164.3	34.9	18	213.2	45.3	68	262.1	55.7
19	18.6	04.0	69	67.5	14.4	19	116.4	24.8	69	165.3	35.2	19	214.2	45.6	69	263.1	56.0
20	19.6	04.2	70	68.5	14.6	20	117.4	25.0	70	166.3	35.4	20	215.2	45.8	70	264.1	56.2
21	20.5	04.4	71	69.4	14.8	121	118.3	25.2	171	167.2	35.6	221	216.1	46.0	271	265 0	56.4
22	21.5	04.6	72	70.4	15.0	22	119.3	25.6	72	168.2	35.8	22	217.1	46.2	72	266.0	56.6
23	22.5	04.8	73	71.4	15.2	23	120.3	25.8	73	169.2	36.0	23	218.1	46.4	73	267.0	56.8
24	23.5	05.0	74	72.4	15.4	24	121.3	25.8	74	170.2	36.2	24	219.1	46.6	74	268.0	57.0
25	24.5	05.2	75	73.4	15.6	25	122.3	26.0	75	171.2	36.4	25	220.1	46.8	75	269.0	57.2
26	25.4	05.4	76	74.3	15.8	126	123.2	26.2	176	172.1	36.6	226	221,0	47.0	276	269.9	57.4
27	26.4	05.6	77	75.3	16.0	27	124.2	26.4	77	173.1	36.8	27	222.0	47.2	77	270.9	57.6
28	27.4	05.8	78	76.3	16.2	28	125.2	26.6	78	174.1	37.0	28	223.0	47.4	78	271.9	37.8
29	28.4	06.0	79	77.3	16.4	29	126.2	26.8	79	175.1	37.2	29	224.0	47.6	79	272.9	58.0
30	29.3	06.2	80	78.2	16.6	30	127.1	27.0	80	176.0	37.4	30	224.9	47.8	80	273.8	58.2
31	30.3	06.4	81	79.2	16.8	131	128.1	27.2	181	177.0	37.6	231	225.9	48.0	281	274.8	58.4
32	31.3	06.7	82	80.2	17.1	32	129.1	27.5	82	178.0	37.9	32	226.9	48.3	82	275.8	58.7
33	32.3	06 9	83	81.2	17.3	33	130.1	27.7	83	179.0	38.1	33	227.9	48.5	83	276.8	58.9
34	33.3	07.1	84	82.2	17.5	34	131.1	27.9	84	180.0	38.3	34	228.9	48.7	84	277.8	59.1
35	34.2	07.3	85	83.1	17.7	35	132.0	28.1	85	180.9	38.5	35	229,8	48.9	85	278.7	59.3
36	35.2	07.5	86	84.1	17.9	136	133.0	28.3	186	181.9	38.7	236	230.8	49.1	286	279.7	59.5
37	36.2	07.7	87	85.1	18.0	37	134.0	28.5	87	182.9	38.9	37	231.8	49.3	87	280.7	59.7
38	37.2	07.9	88	86.1	18.3	38	135.0	28.7	88	183.9	39.1	38	232.8	49.5	88	281.7	59.9
39	38.1	08.1	89	87.0	18.5	39	135.9	28.9	89	184.8	39.3	39	233.7	49.7	89	282.6	60.1
40	39.1	08.3	90	88.0	18.7	40	136.9	29.1	90	185.8	39.5	40	234.7	49.9	90	283.6	60.3
41	40.1	08.5	91	89 0	18.9	141	137.9	29.3	191	186.8	39.7	241	235.7	50.1	291	284.6	60.5
42	41.1	08.7	92	90.0	19.1	42	138.9	29.5	92	187.8	39.9	42	236.7	50.3	92	285.6	60.7
43	42.1	08.9	93	91.0	19.3	43	139.9	29.7	93	188.8	40.1	43	237.7	50.5	93	286.6	60.9
44	43.0	09.2	94	92.9	19.6	44	140.8	30.0	94	189.7	40.4	44	238.6	50.8	94	287.5	61.2
45	44.0	09.4	95	92.9	19.8	45	141.8	30,2	95	190.7	40.6	45	239.6	51.0	95	288.5	61.4
46	45.0	09.6	96	93.9	20.0	146	142.8	30.4	196	191.7	40.8	246	240.6	51.2	296	289.5	61.6
47	46.0	09.8	97	94 9	20.2	47	143.8	30.6	97	192.7	41.0	47	241.6	51.4	97	290.5	61.8
48	46.9	10.0	98	95.8	20.4	48	144.7	30.8	98	193.6	41.2	48	242.5	51.6	98	291.4	62.0
49	47.9	10.2	99	96.8	20.6	49	145.7	31.0	99	194.6	41.4	49	243.5	51.8	99	292.4	62.2
50	48.9	10.4	100	97.8	20.8	150	146.7	31.2	200	195.6	41.6	250	244.5	52.0	300	293.4	62.4
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	01.0	00.2	51	49.7	11.5	101	98.4	22.7	151	147.1	34.0	201	195.9	45.2	251	244.6	56.5
2	01.9	00.4	52	50.7	11.7	02	99,4	22.9	52	148.1	34.2	02	196.8	45,4	52	245.5	56.7
3	02.9	00.7	53	51.6	11.9	03	100.4	23,2	53	149.1	34.4	03	197.8	45.7	53	246.5	56.9
4	03.9	00.9	54	52.6	12.1	04	101.3	23.4	54	150.1	34.6	04	198.8	45.9	54	247.5	57.1
5	04.9	01.1	55	53.6	12.4	05	102.3	23.6	55	151.0	34.9	05	199.7	46.1	55	248.5	57.4
6	05.8	01.3	56	54.6	12.6	106	103.3	23.8	156	152.0	35.1	206	200.7	46.3	256	249.4	57.6
7	06.8	01.6	57	55.5	12.8	07	104.3	24.1	57	153.0	35.3	07	201.7	46.6	57	250.4	57.8
8	07.8	01,8	58	56.5	13.0	08	105.2	24.3	58	154.0	35.5	08	202.7	46.8	58	251.4	58.0
9	08.8	02.0	59	57.5	13.3	09	106.2	24.5	59	154.9	35,8	09	203.6	47.0	59	252.4	58.3
10	09.7	02,2	60	58.5	13 5	10	107.2	24,7	60	155.9	36.0	10	204.6	47.2	60	253.3	58.5
11	10.7	02.5	61	59.4	13.7	111	108.2	25.0	161	156.9	36.2	211	205.6	47.5	261	254.3	58.7
12	11.7	02.7	62	60.4	13.9	12	109.1	25.2	62	157.9	36.4	12	206.6	47.7	62	255.3	58.9
13	12.7	02.9	63	61.4	14.2	13	110.1	25.4	63	158.8	36.7	13	207.5	47.9	63	256,3	59.2
14	13.6	03.1	64	62.4	14.4	14	111.1	25.6	64	159.8	36.9	14	208.5	48.1	64	257.2	59.4
15	14.6	03.4	65	63.3	14.6	15	112.1	25.9	65	160.8	37.1	15	209.5	48.4	65	258.2	59.6
16	15.6	03.6	66	64.3	14.8	116	113.0	26.1	166	161.7	37.3	216	210.5	48.6	266	259.2	59.8
17	16.6	03.8	67	65.3	15.1	17	114.0	26.3	67	162.7	37.6	17	211.4	48.8	67	260.2	60,1
18	17.5	04.0	68	66.3	15.3	18	115.0	26.5	68	163.7	37.8	18	212.4	49.0	68	261.1	60.3
19	18.5	04.3	69	67.2	15.5	19	116.0	26.8	69	164.7	38.0	19	213.4	49.3	69	262.1	60.5
20	19.5	04.5	70	68.2	15.7	20	116.9	27.0	70	165.6	38.2	20	214.4	49.5	70	263.1	60.7
21	20.5	04.7	71	69.2	16.0	121	117.9	27.2	171	166.6	38.5	221	215.3	49.7	271	264.1	61.0
22	21.4	04.9	72	70.2	16.2	22	118.9	27.4	72	167.6	38.7	22	216.3	49.9	72	265.0	61.2
23	22.4	05.2	73	71.1	16.4	23	119.8	27.7	73	168.6	38.9	23	217.3	50.2	73	266.0	61.4
24	23.4	05.4	74	72.1	16.6	24	120.8	27.9	74	169.5	39.1	24	218.3	50.4	74	267.0	61.6
25	24.4	05.6	75	73.1	16.9	25	121.8	28.1	75	170.5	39.4	25	219.2	50.6	75	268.0	61.9
26	25.3	05.8	76	74.1	17.1	126	122.8	28.3	176	171.5	39.6	226	220.2	50.8	276	268.9	62.1
27	26.3	06.1	77	75.0	17.3	27	123.7	28.6	77	172.5	39.8	27	221.2	51.1	77	269.9	62.3
28	27.3	06.3	78	76.0	17.5	28	124.7	28,8	78	173.4	40.0	28	222.2	51.3	78	270.9	62.5
29	28.3	06.5	79	77.0	17.8	29	125.7	29.0	79	174.4	40.3	29	223.1	51.5	79	271.9	62.8
30	29.2	06.7	80	78.0	18.0	30	126.7	29.2	80	175.4	40.5	30	224.1	51 7	80	272.8	63.0
31	30.2	07.0	81	78.9	18.2	131	127.6	29.5	181	176.4	40.7	231	225.1	52.0	281	273.8	63.2
32	31.2	07.2	82	79.9	18.4	32	128,6	29.7	82	177.3	40.9	32	226.1	52.2	82	274.8	63.4
33	32.2	07.4	83	80.9	18.7	33	129.6	29.9	83	178.3	41.2	33	227.0	52.4	83	275.8	63.7
34	33.1	07.6	84	81.8	18.9	34	130.6	30.1	84	179.3	41.4	34	228.0	52.6	84	276.7	63.9
35	34.1	07.9	85	82.8	19.1	35	131.5	30.4	85	180.3	41.6	35	229,0	52.9	85	277.7	64.1
36	35.1	08.1	86	83 8	19.3	136	132.5	30,6	186	181.2	41,8	236	230.0	53.1	286	278.7	64.3
37	36.1	08.3	87	84.8	19.6	37	133.5	30.8	87	182.2	42.1	37	230.9	53.3	87	279.6	64.6
38	37.0	08.5	88	85.7	19.8	38	134.5	31.0	88	183.2	42.3	38	231.9	53.5	88	280.6	64.8
39	38.0	08.8	89	86.7	20.0	39	135.4	31.3	89	184.2	42.5	39	232.9	53.8	89	281.6	65.0
40	39.0	09.0	90	87.7	20.2	40	136.4	31.5	90	185.1	42.7	40	233.9	54.0	90	282 6	65.2
41	39.9	09.2	91	88.7	20.5	141	137.4	31.7	191	186.1	43.0	241	234.8	54.2	291	283.5	65.5
42	40.9	09,4	92	89.6	20.7	42	138.4	31.9	92	187.1	43.2	42	235.8	54.4	92	284.5	65.7
43	41.9	09.7	93	90.6	20.9	43	139.3	32.2	93	188.1	43.4	43	236.8	54.7	93	285.5	65.9
44	42.9	09.9	94	91.6	21.1	44	140.3	32.4	94	189.0	43 6	44	237.8	54.9	94	286.5	66.1
45	43.8	10.1	95	92.6	21.4	45	141.3	32.6	95	190.0	43.9	45	238.7	55.1	95	287.4	66.4
46	44.8	10.3	96	93.5	21.6	146	142.3	32.8	196	191.0	44.1	246	239,7	55.3	296	288,4	66.6
47	45.8	10.6	97	94.5	21.8	47	143,2	33.1	97	192.0	44.3	47	240.7	55.6	97	289.4	66.8
48	46.8	10.8	98	95.5	22.0	48	144.2	33.3	98	192.9	44.5	48	241.6	55.8	98	290.4	67.0
49	47.7	11.0	99	96.5	22.3	49	145.2	33.5	99	193.9	44.8	49	242.6	56.0	99	291.3	67.3
50	48.7	11.2	100	97.4	22.5	150	146.2	33.7	200	194.9	45.0	250	243.6	56.2	300	292.3	67.5
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Lat	Dep

14 Difference of Latitude and Departure for 14 Deg.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep
1	01,0	00.2	51	49.5	12.3	101	98.0	24.4	151	146.5	36.5	201	195.0	48.6	251	243.5	60.7
2	01.9	00.5	52	50.5	12.6	02	99.0	24.7	52	147.5	36.8	02	196.0	48.9	52	244.5	61.0
3	02.9	00.7	53	51.4	12.8	03	99.9	24.9	53	148.5	37.0	03	197.0	49.1	53	245.5	61.2
4	03.9	01.0	54	52.4	13.1	04	100.9	25.2	54	149.4	37.3	04	197.9	49.4	54	246.4	61.5
5	04.9	01.2	55	53.4	13.3	05	101.9	25.4	55	150.4	37.5	05	198.9	49.6	55	247.4	61.7
6	05.8	01.5	56	54.3	13.6	106	102.8	25.7	156	151.4	37.7	206	199.9	49.9	256	248.4	62.0
7	06.8	01.7	57	55.3	13.8	07	103.8	25.9	57	152.3	38.0	07	200.8	50.1	57	249.4	62.2
8	07.8	01.9	58	56.3	14.0	08	104.8	26.1	58	153.3	38.2	08	201.8	50.3	58	250.3	62.4
9	08,7	02.2	59	57.2	14.3	09	105.8	26.4	59	154.3	38.5	09	202.8	50.6	59	251.3	62.7
10	09.7	02.4	60	58.2	14.5	10	106.7	26.6	60	155.2	38.7	10	203.8	50.8	60	252.3	62.9
11	10.7	02.7	61	59.2	14.8	111	107.7	26.9	161	156.2	39.0	211	204.7	51.1	261	253.2	63.2
12	11.6	02.9	62	60.2	15.0	12	108.7	27.1	62	157.2	39.2	12	205.7	51.3	62	254.2	63.4
13	12.6	03.1	63	61.1	15.2	13	109.6	27.3	63	158.2	39.4	13	206,7	51.5	63	255.2	63.6
14	13.6	03.4	64	62.1	15.5	14	110.6	27.6	64	159.1	39.7	14	207.6	51.8	64	256.2	63.9
15	14.6	03.6	65	63.1	15.7	15	111.6	27.8	65	160.1	39.9	15	208.6	52.0	65	257.1	64.1
16	15.5	03.9	66	64.0	16.0	116	112.6	28.1	166	161.1	40.2	216	209.6	52.3	266	258.1	64.4
17	16.5	04.1	67	65.0	16.2	17	113.5	28.3	67	162.0	40.4	17	210.5	52.5	67	259.1	64.6
18	17.5	04.4	68	66.0	16.5	18	114.5	28.6	68	163.0	90.7	18	211.5	52.8	68	260.0	64.9
19	18.4	04.6	69	66.9	16.7	19	115.5	28.8	69	164.0	40.9	19	212.5	53.0	69	261.0	65.1
20	19.4	04.8	70	67.9	16.9	20	116.4	29.0	70	164.9	41.1	20	213.5	53.2	70	262,0	65 3
21	20.4	05.1	71	68.9	17.2	121	117.4	29.3	171	165.9	41.4	121	214.4	53.5	271	262.9	65.6
22	21.3	05.3	72	69.9	17.4	22	118.4	29.5	72	166.9	41.6	22	215.4	53.7	72	263.9	65.8
23	22.3	05.6	73	70.8	17.7	23	119.3	29.8	73	167.9	41.9	23	216.4	54.0	73	264.9	66.1
24	23.3	05.8	74	71.8	17.9	24	120.3	30.0	74	168.8	42.1	24	217.3	54.2	74	265.9	66.3
25	24.3	06.0	75	72.8	18.1	25	121.3	30.2	75	169.8	42.3	25	218.3	54.4	75	266.8	66.5
26	25.2	06.3	76	73.7	18.4	126	122.3	30.5	176	170.8	42.6	226	219.3	54.7	276	267.8	66.8
27	26.2	06.5	77	74.7	18.6	27	123.2	30.7	77	171.7	42.8	27	220.3	54.9	77	268.8	67.0
28	27.2	06.8	78	75.7	18.9	28	124.2	31.0	78	172.7	43.1	28	221.2	55.2	78	269.7	67.3
29	28.1	07.0	79	76.7	19.1	29	125.2	31.2	79	173.7	43.3	29	222 2	55 4	79	270.7	67.5
30	29.1	07.3	80	77.6	19.4	30	126.1	31.5	80	174.6	43.6	30	223.2	55.7	80	271.7	67.8
31	30.1	07.5	81	78.6	19.6	131	127.1	31.7	181	175.6	43.8	231	224.1	55.9	281	272.6	68.0
32	31.0	07.7	82	79.6	19.8	32	128.1	31.9	82	176.6	44.0	32	225.1	56.1	82	273.6	68.2
33	32.0	08.0	83	80.5	20.1	33	129.0	32.2	83	177.6	44.3	33	226.1	56.4	83	274.6	68.5
34	33.0	08.2	84	81.5	20.3	34	130.0	32.4	84	178.5	44.5	34	227.1	56.6	84	275,6	68.7
35	34.0	08.5	85	82.5	20.6	35	131.0	32.7	85	179.5	44.8	35	228.0	56.9	85	276.5	69.0
36	34.9	08.7	86	83.4	20.8	136	232.0	32.9	186	180.5	45.0	236	229.0	57.1	286	277.5	69.2
37	35.9	09.0	87	84.4	21.1	37	132.9	33.2	87	181.4	45.3	37	230.0	57.4	87	278.5	69.5
38	36.9	09.2	88	85.4	21.3	38	133.9	33.4	88	182.4	45.5	38	230,9	57.6	88	279.4	69.7
39	37.8	09.4	89	86.4	21.5	39	134.9	33.6	89	183.4	45.7	39	231.9	57.8	89	280.4	69.9
40	38.8	09.7	90	87.3	21.8	40	135.8	33.9	90	184.4	46.0	40	232.9	58.1	90	281.4	70.2
41	39.8	09.9	91	88.3	22.0	141	136.8	34.1	191	185.3	46.2	241	233.8	58.3	291	282.3	70.4
42	40.8	10.2	92	89.3	22.3	42	137.8	34.4	92	186.3	46.5	42	234.8	58.6	92	283.3	70.7
43	41.7	10.4	93	90.2	22.5	43	138.7	34.6	93	187.3	46.7	43	235.8	58.8	93	284.3	70.9
44	42.7	10.6	94	91.2	22.7	44	139.7	34.8	94	188.2	46.9	44	236.7	59.0	94	285.3	71.1
45	43,7	10.9	95	92.2	23.0	45	140.7	35.1	95	189.2	47.2	45	237.7	59.3	95	286.2	71.4
46	44.6	11.1	96	93.1	23.2	146	141.7	35.3	196	190.2	47.4	246	238.7	59.5	296	287.2	71.6
47	45.6	11.4	97	94.1	23.5	47	142.6	35.6	97	191.1	47.7	47	239.7	59.8	97	288.2	71.9
48	46.6	11.6	98	95.1	23.7	48	143 6	35.8	98	192.1	47.9	48	240 6	60.0	98	289.1	72.1
49	47.5	11.9	99	96.1	24,0	49	144.6	36.1	99	193.1	48.2	49	241.6	60.3	99	290.1	72.4
50	48.5	12.1	100	97.0	24.2	150	145.5	36.3	200	194.1	48.4	250	242.6	60.5	300	291.1	72.6
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

for 76 Deg.

Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	01.6	00.3	51	49.3	13.2	101	97.6	26.1	151	145.8	39.1	201	194.1	52.0	251	242.4	65.0
2	01.9	00.5	52	50.2	13.5	02	98.5	26.4	52	146.8	39.3	02	195.1	52.3	52	243.4	65.2
3	02.9	00.8	53	51.2	13.7	03	99,5	26.7	53	147.8	39.6	03	196.1	52.5	53	244.4	65.5
4	03.9	01.0	54	52.2	14.0	04	100.5	26.9	54	148.7	39.9	04	197.0	52.8	54	245.3	65.7
5	04.8	01.3	55	53.1	14.2	05	101.4	27.2	55	149.7	40.1	05	198.0	53.1	55	246.3	66.0
6	05.8	01.6	56	54.1	14.5	106	102.4	27.4	156	150.7	40.4	206	199.0	53.3	256	247.3	66.3
7	06.8	01,8	57	55.1	14.8	07	103.4	27.7	57	151.6	40.6	07	199.9	53.6	57	248.2	66.5
8	07.7	02.1	58	56.0	15.0	08	104.3	28.0	58	152.6	40.9	08	200.9	53.8	58	249.2	66.8
9	08.7	02,3	59	57.0	15.3	09	105.3	28.2	59	153.6	41.1	09	201.9	54.1	59	250.2	67.0
10	09.7	02.6	60	58.0	15.5	10	106.2	28.5	60	154.5	41.4	10	202.8	54.3	60	251.1	67.3
11	10.6	02.8	61	58.9	15.8	111	107.2	28,7	161	155.5	41.7	211	203.8	54.6	261	252.1	67.5
12	11.6	03.1	62	59.9	16.0	12	108.2	29.0	62	156.5	41,9	12	204.8	54.9	62	253.1	67.8
13	12.6	03.4	63	60.9	16.3	13	109.1	29.2	63	157.4	42.2	13	205.7	55.1	63	254.0	68.1
14	13.5	03.6	64	61.8	16.6	14	110.1	29.5	64	158.4	42.4	14	206.7	55.4	64	255.0	68.3
15	14.5	03.9	65	62.8	16.8	15	111.1	29.8	65	159.4	42.7	15	207.7	55.6	65	256,0	68.6
16	15.5	04.1	66	63.7	17.1	116	112.0	30.0	166	160.3	43.0	216	208.6	55.9	266	256.9	68.8
17	16.4	04.4	67	64.7	17.3	17	113.0	30.3	67	161.3	43.2	17	209.6	56.1	67	257.9	69.1
18	17.4	04.7	68	65.7	17.6	18	114.0	30,5	68	162.3	43.5	18	210.6	56 4	68	258.9	69.4
19	18.4	04.9	69	66.6	17.9	19	114.9	30.8	69	163.2	43.7	19	211.5	56.7	69	259.8	69.6
20	19.3	05.2	70	67.6	18.1	20	115.9	31.1	70	164.2	44.0	20	212.5	56.9	70	260.8	69.9
21	20.3	05.4	71	68.6	18.4	121	116.9	31.3	171	165.2	44.3	221	213.5	57.2	271	261.8	70,1
22	21.2	05.7	72	69.5	18.6	22	117.8	31.6	72	166.1	44.5	22	214.4	57.5	72	262.7	70.4
23	22.2	06.0	73	70.5	18.9	23	118.8	31.8	73	167.1	44.8	23	215.4	57.7	73	263.7	70.7
24	23.2	06.2	74	71.5	19.2	24	119.8	32.1	74	168.1	45.0	24	216.4	58.0	74	264.7	70.9
25	24.1	06.5	75	72.4	19.4	25	120.7	32.4	75	169.0	45.3	25	217.3	58.2	75	265.6	71.2
26	25.1	06.7	76	73.4	19.7	126	121.7	32.6	176	170.0	45.5	226	218.3	58.5	276	266.6	71.4
27	26.1	07.0	77	74.4	19.9	27	122.7	32.9	77	171.0	45.8	27	219.3	58.7	77	267.6	71.7
28	27.0	07.2	78	75.3	20.2	28	123.6	33.1	78	171.9	46.1	28	220.2	59.0	78	268.5	71.9
29	28.0	07.5	79	76.3	20.4	29	124.6	33.4	79	172.9	46.3	29	221.2	59.3	79	269.5	72.2
30	29.0	07.8	80	77.3	20.7	30	125.6	33.6	80	173.9	46.6	30	222.2	59.5	80	270.5	72.5
31	29.9	08.0	81	78.2	21.0	131	126.5	33.9	181	174.8	46.8	231	223.1	59.8	281	271.4	72.7
32	30.9	08.3	82	79.2	21.2	32	127.5	34.2	82	175.8	47.1	32	224.1	60.0	82	272.4	73.0
33	31.9	08.5	83	80.2	21.5	33	128,5	34.4	83	176.8	47.4	33	225.1	60.3	83	273.4	73.2
34	32.8	08.8	84	81.1	22.7	34	129.4	34,7	84	177.7	47.6	34	226.0	60.6	84	274.3	73.5
35	33.8	09.1	85	82.1	22.0	35	130.4	34.9	85	178.7	47.9	35	227.0	60.8	85	275.3	73.8
36	34.8	09,3	86	83.1	22.3	136	131.4	35.2	186	179.7	48.1	236	228.0	61.1	286	276.2	74.0
37	35.7	09.6	87	84.0	22.5	37	132.3	35.5	87	180.6	48.4	37	228.9	61.3	87	277.2	74.3
38	36.7	09.8	88	85.0	22.8	38	133.3	35.7	88	181.6	48.7	38	229,9	61.6	88	278.2	74.5
39	37.7	10.1	89	86.0	23,0	39	134.3	36.0	89	182.6	48.9	39	230.9	61.9	89	279.1	74.8
40	38.6	10.4	90	86.9	23.3	40	135.2	36.2	90	183.5	49.2	40	231.8	62.1	90	280.1	75.0
41	39.6	10.6	91	87.9	23.6	141	136.2	36,5	191	184.5	49.4	241	232.8	62.4	291	281.1	75.3
42	40.6	10.9	92	88.9	23.8	42	137.2	36.7	92	185.5	49.7	42	233.7	62.6	92	282 0	75.6
43	41.5	11.1	93	89.8	24.1	43	138.1	37.0	93	186.4	49.9	43	234.7	62.9	93	283.0	75.8
44	42.5	11.4	94	90.8	24.3	44	139.1	37.3	94	187.4	50,2	44	235.7	63.1	94	284.0	76.1
45	43.5	11.6	95	91.8	24.6	45	140.1	37.5	95	188.4	50.5	45	236.6	63.4	95	284.9	76.3
46	44.4	11.9	96	92.7	24.8	146	141.0	37.8	196	189.3	50.7	246	237.6	63,7	296	285.9	76.6
47	45.4	12.2	97	93.7	25.1	47	142.0	38.0	97	190.3	51.0	47	238.6	63.9	97	286.9	76.9
48	46.4	12.4	98	94.7	25.4	48	143,0	38.3	98	191.2	51.2	48	239,5	64.1	98	287.8	77.1
49	47.3	12.7	99	95.6	25.6	49	143.9	38.6	99	192.2	51.5	49	240.5	64.4	99	288,8	77.4
50	48.3	12.9	100	96.6	25.9	150	144.9	38.8	200	193.2	51.8	250	241.5	64.7	300	289.8	77.6
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Lat	Dep

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep
1	01,0	00.3	51	49.0	14.1	101	97.1	27.8	151	145.1	41.6	201	193.2	55.4	251	241.2	69.2
2	01.9	00.6	52	50.0	14.3	02	98.0	28.1	52	146.1	41.9	02	194.1	55.7	52	242.2	69.5
3	02.9	00.8	53	50.9	14.6	03	99.0	28.4	53	147.1	42.2	03	195.1	55.9	53	243.2	69.7
4	03.8	01.1	54	51.9	14.9	04	100.0	28.7	54	148.0	42.4	04	196.1	56.2	54	244.1	70.0
5	04.8	01.4	55	52.9	15.2	05	100.9	28.9	55	149.0	42.7	05	197.0	56.5	55	245.1	70.3
6	05.8	01.7	56	53.8	15.4	106	101.9	29.2	156	149.9	43.0	206	198.0	56.8	256	246.0	70.6
7	06.7	01.9	57	54.8	15.7	07	102.8	29.5	57	150.9	43.3	07	199.0	57.0	57	247.0	70.8
8	07.7	02.2	58	55.7	16.0	08	103.8	29.8	58	151.9	43.5	08	199.9	57.3	58	248.0	71.1
9	08.7	02.5	59	56.7	16.3	09	104.8	30.0	59	152.8	43.8	09	200.9	57.6	59	248.9	71.4
10	09.6	02.8	60	57.7	16.5	10	105.7	30.3	60	153.8	44.1	10	201.8	57.9	60	249.9	71.7
11	10.6	03.0	61	58.6	16.8	111	106.7	30.6	161	154.7	44.4	211	202.8	58.2	261	250.9	71.9
12	11.5	03.3	62	59.6	17.1	12	107.6	30.9	62	155.7	44.6	12	203.8	58.4	62	251.8	72.2
13	12.5	03.6	63	60.6	17.4	13	108.6	31.1	63	156.7	44.9	13	204.7	58.7	63	252.8	72.5
14	13.5	03.9	64	61.5	17.6	14	109.6	31.4	64	157.6	45.2	14	205.7	59.0	64	253.7	72.8
15	14.4	04.1	65	62.5	17.9	15	110.5	31.7	65	158.6	45.5	15	206,6	59.3	65	254.7	73.0
16	15.4	04.4	66	63.4	18.2	116	111.5	32.0	166	159.5	45.7	216	207.6	59.5	266	255.7	73.3
17	16.3	04.7	67	64.4	18.5	17	112.5	32.2	67	160.5	46.0	17	208.6	59.8	67	256.6	73.6
18	17.3	05.0	68	65.4	18.7	18	113.4	32.5	68	161.5	46.3	18	209.5	60.1	68	257.6	73.9
19	18.3	05.2	69	66.3	19.0	19	114.4	32.8	69	162.4	46.6	19	210.5	60.4	69	258.5	74.1
20	19.2	05.5	70	67.3	19.3	20	115.3	33.1	70	163.4	46.9	20	211.4	60.6	70	259.5	74.4
21	20.2	05.8	71	68.2	19.6	121	116.3	33.3	171	164.4	47.1	121	212.4	60.9	271	260.5	74.7
22	21.1	06.1	72	69.2	19.8	22	117.3	33.6	72	165.3	47.4	22	213.4	61.2	72	261.4	75.0
23	22.1	06.3	73	70.2	20.1	23	118.2	33.9	73	166.3	47.7	23	214.3	61.5	73	262,4	75 2
24	23.1	06.6	74	71.1	20.4	24	119.2	34.2	74	167.2	48.0	24	215.3	61.7	74	263.3	75.5
25	24.0	06.9	75	72.1	20.7	25	120.1	34.4	75	168.2	48.2	25	216.3	62.0	75	264.3	75.8
26	25.0	07.2	76	73.0	20.9	126	121.1	34.7	176	169.2	48.5	226	217.2	62.3	276	265.3	76.1
27	26.0	07.4	77	74.0	21.2	27	122.1	35.0	77	170.1	48.8	27	218.2	62.6	77	266.2	76.3
28	26.9	07.7	78	75.0	21.5	28	123.0	35.3	78	171.1	49.1	28	219.1	62.8	78	267.2	76.6
29	27.9	08.0	79	75.9	21.8	29	124.0	35.6	79	172.0	49.3	29	220.1	63.1	79	268.2	76.9
30	28.8	08.3	80	76.9	22.0	30	124.9	35.8	80	173.0	49.6	30	221.1	63.4	80	269.1	77.2
31	29.8	08.5	81	77.9	22.3	131	125.9	36.1	181	174.0	49.9	231	222 0	63.7	281	270.1	77.4
32	30.8	08.8	82	78.8	22.6	32	126.9	36.4	82	174.9	50.2	32	223.0	63.9	82	271.0	77.7
33	31.7	09.1	83	79.8	22.9	33	127.8	36.7	83	175.9	50.4	33	223,9	64.2	83	272.0	78.0
34	32.7	09.4	84	80.7	23.1	34	128.8	36.9	84	176.8	50.7	34	224.9	64.5	84	273.0	78.3
35	33.6	09.6	85	81.7	23.4	35	129.8	37.2	85	177.8	51.0	35	225.9	64.8	85	273.9	78.5
36	34.6	09.9	86	82.7	23.7	136	130.7	37.5	186	178.8	51.3	236	226.8	65.0	286	274.9	78.8
37	35.6	10.2	87	83.6	24.0	37	131.7	37.8	87	179.7	51.5	37	227.8	65.3	87	275.8	79.1
38	36.5	10.5	88	84.6	24.3	38	132.6	38.0	88	180.7	51.8	38	228.7	65.6	88	276.8	79.4
39	37.5	10.7	89	85.5	24.5	39	133.6	38.3	89	181.7	52.1	39	229.7	65.9	89	277.8	79.6
40	38.4	11.0	90	86.5	24.8	40	134.6	38.6	90	182.6	52.4	40	230.7	66.1	90	278.7	79.9
41	39.4	11.3	91	87.5	25.1	141	135.5	38.9	191	183.6	52.6	241	231.6	66.4	291	279.7	80.2
42	40.4	11.6	92	88.4	25.4	42	136.5	39.1	92	184.5	52.9	42	232.6	66.7	92	280.6	80.5
43	41.3	11.9	93	89.4	25.6	43	137.4	39.4	93	185.5	53.2	43	233.6	67.0	93	281.6	80.8
44	42.3	12.1	94	90.3	25.9	44	138.4	39.7	94	186.5	53.5	44	234.5	67.2	94	282.6	81.0
45	43.3	12.4	95	91.3	26.2	45	139.4	40.0	95	187.4	53.7	45	235.5	67.5	95	283.5	81.3
46	44.2	12.7	96	92.3	26.5	146	140.3	40.2	196	188.4	54.0	246	236.4	67.8	296	284.5	81.6
47	45.2	13.0	97	93.2	26.7	47	141.3	40.5	97	189.3	54.3	47	237.4	68.1	97	285.5	81.9
48	46.1	13.2	98	94.2	27.0	48	142.2	40.8	98	190.3	54.6	48	238.4	68.3	98	286.4	82.1
49	47.1	13.5	99	95.2	27.3	49	143 2	41.1	99	191.3	54.8	49	239.3	68.6	99	287.4	82.4
50	48.1	13.8	100	96.1	27.6	150	144.2	41.3	200	192.2	55.1	250	240 3	68.9	300	288.3	82.7
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	01.0	00.3	51	48.8	14.9	101	96.6	29,5	151	144.4	44.1	201	192.2	58.8	251	240.0	73.3
2	01.9	00.6	52	49.7	15.2	02	97.5	29.8	52	145.3	44.4	02	193.2	59.0	52	241.0	73,6
3	02.9	00.9	53	50.7	15.5	03	98.5	30.1	53	146.3	44.7	03	194.1	59.3	53	241.9	73.9
4	03.8	01.2	54	51.6	15.8	04	99.4	30.4	54	147.3	45.0	04	195.1	59.6	54	242.9	74.1
5	04.8	01.5	55	52.6	16.1	05	100.4	30.7	55	148.2	45.3	05	196.0	59.9	55	243.8	74.4
6	05.7	01.8	56	53.5	16.4	106	101.4	31.0	156	149.2	45.6	206	197.0	60.2	256	244.8	74.7
7	06.7	02.0	57	54.5	16.7	07	102.3	31.3	57	150.1	45.9	07	197.9	60.5	57	245.8	75.0
8	07.6	02.3	58	55.5	17.0	08	103.3	31.6	58	151.1	46.2	08	198.9	60.8	58	246.7	75.3
9	08.6	02.6	59	56.4	17.2	09	104.2	31.9	59	152.0	46.5	09	199.9	61.1	59	247.7	75.6
10	09 6	02.9	60	57.4	17.5	10	105.2	32.2	60	153.0	46.8	10	200.8	61.4	60	248.6	75.9
11	10.5	03.2	61	58.3	17.8	111	106.1	32.4	161	154.0	47.1	211	201.8	61.7	261	249.6	76.2
12	11.5	03.5	62	59.3	18.1	12	107.1	32.7	62	154.9	47.4	12	202.7	62.0	62	250.5	76.5
13	12.4	03.8	63	60.2	18.4	13	108.1	33.0	63	155.9	47.6	13	203.7	62.3	63	251.5	76.8
14	13.4	04.1	64	61,2	18.7	14	109.0	33.3	64	156.8	47.9	14	204.6	62 6	64	252.4	77.1
15	14.3	04.4	65	62.2	19 0	15	110 0	33.6	65	157.8	48.2	15	205.6	62.8	65	253.4	77.4
16	15.3	04.7	66	63.1	19.3	1 6	110.9	33.9	166	158.7	48.5	216	206.5	63.1	266	254.4	77.7
17	16.3	05.0	67	64.1	19.6	17	111.9	34.2	67	159.7	48.8	17	207.5	63.4	67	255 3	77.9
18	17.2	05.3	68	65.0	19.9	18	112.8	34.5	68	160.6	49.1	18	208.5	63.7	68	256.3	78.2
19	18.2	05 6	69	66.0	20.2	19	113.8	34.8	69	161 6	49.4	19	209.4	64.0	69	257.2	78.5
20	19.1	05.8	70	66.9	20.5	20	114.7	35 1	70	162.6	49.7	20	210.4	64.3	70	258.2	78,8
21	20 1	06.1	71	67.9	20.8	121	115.7	35 4	171	1 3.5	50.0	221	211.3	64.6	271	259.1	79.1
22	21.0	06.4	72	68.	21.0	22	116.7	35.7	72	164.5	50.3	22	212.3	64.9	72	250.1	79.4
23	22.0	06.7	73	69.8	21.3	23	117.6	36.0	73	165.4	50.6	23	213.2	65,2	73	251.1	79.7
24	22.9	07.0	74	70.8	21.6	24	118.6	36.2	74	166.4	50.9	24	214.2	65.5	74	252.0	80.0
25	23.9	07.3	75	71.7	21.9	25	119.5	36.5	75	167.3	51.2	25	215.2	65.8	75	253.0	80.3
26	24.9	07.6	76	72.7	22.2	126	120.5	36.8	176	168.3	51.4	226	216.1	66.1	276	253.9	80.6
27	25.8	07.9	77	73.6	22.5	27	121.4	37.1	77	169.3	51.7	27	217.1	66.4	77	254.9	80.9
28	26.8	08.2	78	74.6	22.8	28	122.4	37.4	78	170.2	52.0	28	218.0	66.6	78	255.8	81.2
29	27.7	08.5	79	75.5	23.1	29	123.4	37.7	79	171.2	52.3	29	219.0	66.9	79	256.8	81.5
30	28.7	08.8	80	76.5	23.4	30	124,3	38,0	80	172.1	52.6	30	219.9	67.2	80	257.7	81.7
31	39.6	09.1	81	77.5	23.7	131	125.3	38.3	181	173.1	52.9	231	220.9	67.5	281	258.7	82.0
32	30.6	09.4	82	78.4	24.0	32	126.2	38.6	82	174.0	53.2	32	221.8	67.8	82	269.7	82.3
33	31.6	09.6	83	79.4	24.3	33	127.2	38.9	83	175.0	53 5	33	222.8	68.1	83	260,6	82.6
34	32,5	09.9	84	80.3	24.6	34	128.1	39.2	84	175.9	53.8	34	223.8	68.4	84	261.6	82.9
35	33.5	10 2	85	81.3	24.8	35	129.1	39.5	85	176.9	54.1	35	224.7	68.7	85	262.5	83.2
36	34.4	10.5	86	82.2	25.1	136	130.0	39.8	186	177.9	54.4	236	225.7	69.0	286	273.5	83.5
37	35.4	10.8	87	83.2	25.4	37	131.0	40.0	87	178.8	54.7	37	226.6	69.3	87	274.4	83.8
38	36.3	11.1	88	84.1	25.7	38	132.0	40.3	88	179.8	55.0	38	227.6	69.6	88	275.4	84.1
39	37.3	11.4	89	85.1	26.0	39	132.9	40.6	89	180.7	55.2	39	228.5	69.9	89	276.4	84.4
40	38.2	11.7	90	86.1	26.3	40	133.9	40.9	90	181.7	55.5	40	229.5	70.2	90	277.3	84.7
41	39.2	12.0	91	87.0	26.6	141	134.8	41,2	191	182.6	55.8	241	230.5	70.4	291	278.3	85.0
42	40.2	12.3	92	88.0	26.9	42	135.8	41 5	92	183.6	56.1	42	231.4	70.7	92	279.2	85.3
43	41.1	12.6	93	88.9	27.2	43	136.7	41.8	93	184.6	56.4	43	232.4	71.0	93	280.2	85.5
44	42.1	12.9	94	89.9	27.5	44	137.7	42.1	94	185.5	56.7	44	233.3	71.3	94	281.1	85.8
45	43.0	13.2	95	90.8	27.8	45	138.7	42.4	95	186.5	57,0	45	234.3	71.6	95	282.1	86.1
46	44.0	13.4	96	91.8	28.1	146	139.6	42.7	196	187.4	57:3	246	235.2	71.9	296	283.0	86.4
47	44.9	13.7	97	92.8	28.4	47	140.6	43.0	97	188.4	57.6	47	236.2	72.1	97	284.0	86.7
48	45.9	14.0	98	93.7	28.6	48	141.5	43.3	98	189.3	57.9	48	237.1	72.4	98	285.0	87.0
49	46.9	14.3	99	94.7	28.9	49	142.5	43.6	99	190.3	58.2	49	238.1	72.7	99	285.9	87,3
50	47.8	14.6	100	95,6	29.2	50	143.4	43,8	200	191.2	58.5	50	239.1	73.0	300	286.9	87.6
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat.

for 73 Deg.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep
1	01,0	00.3	51	48.5	15.8	101	96.1	31.2	151	143 6	46.7	201	191.2	62.1	251	238.7	77.6
2	01.9	00.6	52	49.5	16.1	02	97.0	31.5	52	144.6	47.0	02	192.1	62.4	52	239.7	77.9
3	02.9	00.9	53	50.4	16.4	03	98.0	31.8	53	145.5	47.3	03	193.1	62.7	53	240 6	78.2
4	03.8	01.2	54	51.4	16.7	04	98.9	32.1	54	146.5	47.6	04	194.0	63.c	54	241.6	78.5
5	04 8	01.5	55	52.3	17.0	05	99.9	32.4	55	147.4	47.9	05	195.0	63.3	55	242.5	78.8
6	05.7	01.9	56	53.3	17.3	106	100.8	32.8	156	148.4	48.2	206	195.9	63.7	256	243.5	79.1
7	06.7	02.2	57	54.2	17.6	07	101.8	33.1	57	149.3	48.5	07	196.9	64.0	57	244.4	79.4
8	07.6	02.5	58	55.2	17.9	08	102.7	33.4	58	150.3	48.8	08	197.8	64.3	58	245.4	79.7
9	08,6	02.8	59	56.1	18.2	09	103.7	33.7	59	151.2	49.1	09	198.8	64.6	59	246.3	80.0
10	09.5	03.1	60	57.1	18.5	10	104.6	34.0	60	152.2	49.4	10	199.-	64.9	60	247.3	80.3
11	10.5	03.4	61	58.0	18.8	111	105.6	34.3	161	153.1	49.7	211	200.7	65 2	261	248.2	80.6
12	11.4	03.7	62	59.0	19.2	12	106.5	34 6	62	154.1	50.1	12	201.6	65.5	62	249.2	81.0
13	12.4	04.0	63	59.9	19.5	13	107.5	34.9	63	155.0	50.4	13	202.6	65.8	63	250.1	81.3
14	13.3	04.3	64	60.9	19,8	14	108.4	35.2	64	156.0	50.7	14	203.5	66.1	64	251.1	81.6
15	14.3	04.6	65	61.8	20.1	15	109.4	35.5	65	156.9	51.0	15	204.5	66 4	65	252.0	81.9
16	15.2	04.9	66	62.8	20.4	116	110.3	35.8	166	157.9	51.3	216	205.4	66.7	266	253.0	82.2
17	16.2	05.3	67	63.7	20.7	17	111.3	36.2	67	158.8	51.6	17	206,4	67.1	67	253.9	82.5
18	17.1	05.6	68	64.7	21.0	18	112.2	36.5	68	159.8	51.9	18	207.3	67.4	68	254.9	82.8
19	18.1	05.9	69	65.6	21.3	19	113.2	36.8	69	160.7	52.2	19	208.3	67.7	69	255.8	83.1
20	19.0	06.2	70	66.6	21.6	20	114.1	37.1	70	161 7	52.5	20	209.2	68.0	70	256.8	83.4
21	20 0	06.5	71	67.5	21.9	121	115.1	37.4	171	162.6	52.8	121	210.2	68.3	271	257.7	83.7
22	20.9	06.8	72	68.5	22.2	22	116.0	37.7	72	163.6	53.1	22	211.1	68.6	72	258.7	84.0
23	21.9	07.1	73	69.4	22.6	23	117.0	38.0	73	164.5	53.5	23	212.1	68.9	73	259.6	84.4
24	22.8	07.4	74	70.4	22.9	24	117.9	38.3	74	165.5	53.8	24	213.0	69.2	74	260.6	84,7
25	23.8	07.7	75	71.3	23.2	25	118.9	38.6	75	166.4	54.1	25	214.0	69.5	75	261.5	85.0
26	24.7	08.0	76	72.3	23 5	126	119.8	38.9	176	167.4	54.4	226	214.9	69.8	276	262,5	85.3
27	25.7	08.3	77	73.2	23.8	27	120.8	39.2	77	168.3	54.7	27	215.9	70.1	77	263.4	85.6
28	26.6	08.7	78	74.2	24,1	28	121.7	39.6	78	169.3	55.0	28	216.8	70.5	78	264.4	85.9
29	27.6	09.0	79	75.1	24.4	29	122.7	39 9	79	170.2	55.3	29	217.8	70.8	79	265.3	86.2
30	28.5	09.3	80	76.1	24.7	30	123.6	40.2	80	171.2	55.6	30	218.7	71.1	80	266.3	86.5
31	29.5	09.6	81	77.0	25.0	131	124.6	40.5	181	172.1	55.9	231	219.7	71.4	281	267.2	86.8
32	30.4	09.9	82	78.0	25.3	32	125.5	40.8	82	173.1	56.2	32	220.6	71.7	82	268.2	87.1
33	31.4	10.2	83	78.9	25.6	33	126.5	41.1	83	174.0	56.5	33	221.6	72.0	83	269.1	87.4
34	32.3	10.5	84	79 9	26 0	34	127.4	41.4	84	175.0	56.9	34	222.5	72.3	84	270.1	87.8
35	33.3	10.8	85	80.8	26.3	35	128.4	41.7	85	175.9	57.2	35	223.5	72.6	85	271.0	88.1
36	34.2	11.1	86	81.8	26 6	136	129.3	42.0	186	176.9	57.5	236	224.4	72.9	286	272.0	88.4
37	35.2	11.4	87	82.7	26.9	37	130.3	42.3	87	177.8	57.8	37	225.4	73.2	87	272.9	88.7
38	36.1	11.7	88	83.7	27.2	38	131.2	42.6	88	178.8	58.1	38	226.3	73.5	88	273.9	89.0
39	37.1	12.1	89	84.6	27.5	39	132.2	43.0	89	179.7	58.4	39	227.3	73.9	89	274.8	89.3
40	38.0	12.4	90	85.6	27.8	40	133.1	43.3	90	180.7	58.7	40	228.2	74.2	90	275,8	89.6
41	39.0	12.7	91	86.5	28.1	141	134.1	43.6	191	181.6	59.0	241	229.2	74.5	291	276.7	89.9
42	39.9	13.0	92	87.5	28.4	42	135.0	43.9	92	182.6	59.3	42	230.1	74.8	92	277.7	90.2
43	40.9	13.3	93	88.4	28.7	43	136.0	44.2	93	183.5	59.6	43	231.1	75.1	93	278.6	90.5
44	41.8	13.6	94	89.4	29.0	44	136.9	44.5	94	184.5	59.9	44	232.0	75 4	94	279.6	90.8
45	42.8	13.9	95	90.3	29.4	45	137.9	44.8	95	185.4	60.3	45	233.0	75.7	95	280.5	91.2
46	43,7	14.2	96	91.3	29.7	146	138.8	45.1	196	186.4	60.6	246	233.9	76.0	296	281.5	91.5
47	44.7	14.5	97	92.2	30.0	47	139.8	45.4	97	187.3	60.9	47	234.9	76.3	97	282.4	91.8
48	45.6	14.8	98	93.2	30.3	48	140.7	45.7	98	188.3	61.2	48	235.8	76.6	98	283.4	92.1
49	46.6	15.1	99	94.1	30.6	49	141.7	46.0	99	189.2	61.5	49	236.8	76.9	99	284.3	92.4
50	47.6	15.5	100	95.1	30.9	150	141.7	46.4	200	190.2	61.8	250	237.8	77.3	300	285.3	92.7
Dist	D	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	00.9	00.3	51	48.2	16.6	101	95.5	32.9	151	142.8	49.2	201	190.0	65.4	251	237,3	81.7
2	01.9	00.7	52	49.2	16.9	02	96.4	33.2	52	143.7	49.5	02	191.0	65.8	52	238.3	82.1
3	02.8	01.0	53	50.1	17.3	03	97.4	33.5	53	144.7	49.8	03	191,9	66.1	53	239.2	82.4
4	03.8	01.3	54	51.1	17.6	04	98.3	33.9	54	145.6	50.1	04	192.9	66.4	54	240.1	82.7
5	04.7	01,6	55	52.0	17.9	05	99,3	34.2	55	146.5	50,5	05	193.8	66.7	55	241.1	83.0
6	05.7	02.0	56	52.9	18 2	106	100.2	34.5	156	147.5	50.8	206	194.8	67.1	256	242.0	83.4
7	06.6	02,3	57	53.9	18.6	07	101.2	34.8	57	148.4	51.1	07	195.7	67.4	57	243.0	83.7
8	07.6	02.6	58	54.8	18.9	08	102.1	35.2	58	149.4	51.4	08	196.7	67.7	58	243.9	84.0
9	08.5	02.9	59	55.8	19.2	09	103.1	35.5	59	150.3	51.8	09	197.6	68.1	59	244.9	84.3
10	09.5	03.3	60	56.7	19.5	10	104.0	35.8	60	151.3	52.1	10	198.5	68.4	60	245.8	84.7
11	10.4	03.6	61	57.7	19.9	111	104.9	36.1	161	152.2	52.4	211	199.5	68.7	261	246.8	85.0
12	11.3	03.9	62	58.6	20.2	12	105.9	36.5	62	153.2	52.7	12	200.4	69 0	62	247.7	85.3
13	12.3	04.2	63	59.6	20.5	13	106.8	36.8	63	154.1	53.1	13	201.4	69.4	63	248.7	85.6
14	13.2	04.6	64	60.5	20.8	14	107.8	37.1	64	155.1	53 4	14	202.3	69.7	64	249.6	86.0
15	14.2	04.9	65	61.5	21.2	15	108.7	37.4	65	156.0	53.7	15	203.3	70.0	65	250.5	86 3
16	15.1	05.2	66	62.4	21.5	116	109.7	37.8	166	156.9	54.0	216	204.2	70.3	266	251.5	86.6
17	16.1	05.5	67	63.3	21.8	17	110.6	38.1	67	157.9	54.4	17	205.2	70.7	67	252.4	86.9
18	17.0	05.9	68	64.3	22.1	18	111.6	38.4	68	158.8	54.7	18	206.1	71.0	68	253.4	87.3
19	18.0	06.2	69	65.2	22.5	19	112.5	38,7	69	159.8	55.0	19	207.1	71.3	69	254.3	87.6
20	18.9	06.5	70	66.2	22.8	20	113.5	39.1	70	160 7	55.4	20	208.0	71.6	70	255.3	87.9
21	19.9	06.8	71	67.1	23.1	121	114.4	39.4	171	161.7	55.7	221	208.9	72.0	271	256,2	88.2
22	20.8	07.2	72	68.1	23 4	22	115.3	39.7	72	162.6	56.0	22	209.9	72.3	72	257.2	88.6
23	21.7	07.5	73	69.0	23.8	23	116.3	40.0	73	163.6	56.3	23	210.8	72,6	73	258.1	88.9
24	22.7	07.8	74	70.0	24.1	24	117.2	40.4	74	164.5	56.7	24	211.8	72.9	74	259.1	89.2
25	23.6	08.1	75	70.9	24.4	25	118.2	40,7	75	165.5	57.0	25	212.7	73.3	75	260.0	89.5
26	24.6	08.5	76	71.9	24.7	126	119.1	41.0	176	166.4	57.3	226	213.7	73.6	276	260.9	89.9
27	25.5	08.8	77	72.8	25.1	27	120.1	41.4	77	167.3	57.6	27	214.6	73.9	77	261.9	90,2
28	26.5	09.1	78	73.7	25.4	28	121.0	41.7	78	168.3	58.0	28	215.6	74.2	78	262.8	90.5
29	27.4	09,4	79	74.7	25.7	29	122.0	42.0	79	169.2	58.3	29	216.5	74.6	79	263.8	90.8
30	28.4	09.8	80	75.6	26.0	30	122.9	42.3	80	170.2	58.6	30	217.5	74.9	80	264.7	91.2
31	29.3	10.1	81	76.6	26.4	131	123.9	42.7	181	171.1	58.9	231	218.4	75.2	281	265.7	91.5
32	30.3	10.4	82	77.5	26.7	32	124.8	43,0	82	172.1	59.3	32	219.3	75,5	82	266.6	91.8
33	31.2	10.7	83	78.5	27.0	33	125.7	43.3	83	173.0	59.6	33	220.3	75.9	83	267.6	92.2
34	32.1	11.1	84	79.4	27.4	34	126.7	43.6	84	174.0	59.9	34	221.2	76.2	84	268.5	92.5
35	33.1	11.4	85	80.4	27.7	35	127.6	44,0	85	174.9	60.2	35	222.2	76.5	85	269.5	92.8
36	34.0	11.7	86	81.3	28.0	136	128,6	44.3	186	175.9	60.6	236	223.1	76.8	286	270.4	93.1
37	35.0	12.0	87	82.3	28.3	37	129.5	44.6	87	176.8	60.9	37	224.1	77.2	87	271.3	93.4
38	35.9	12.4	88	83 2	28.7	38	130.5	44.9	88	177.7	61.2	38	225.0	77.5	88	272.3	93.8
39	36.9	12.7	89	84.1	29.0	39	131.4	45.3	89	178.7	61.5	39	226.0	77.8	89	273.2	94 1
40	37.8	13.0	90	85.1	29.3	40	132.4	45.6	90	179.6	61,9	40	226.9	78.1	90	274.2	94.4
41	38.8	13.3	91	86.0	29.6	141	133.3	45.9	191	180.6	62.2	241	227.9	78.5	291	275.1	94.7
42	39.7	13.7	92	87.0	30.0	42	134.3	46.2	92	181.5	62.5	42	228.8	78.8	92	276.1	95.1
43	40.7	14.0	93	87.9	30.3	43	135.2	46.6	93	182.5	62.8	43	229,7	79.1	93	277.0	95.4
44	41.6	14.3	94	88.9	30.6	44	136.1	46.9	94	183.4	63.2	44	230.7	79.4	94	278.0	95.7
45	42.5	14.7	95	89.8	30.9	45	137.1	47.2	95	184.4	63.5	45	231.6	79.8	95	278.9	96.1
46	43.5	15.0	96	90.8	31.3	146	138.0	47.5	196	185.3	63.8	246	232.6	80.0	296	279.9	96.4
47	44.4	15.3	97	91.7	31.6	47	139.0	47.9	97	186.3	64.1	47	233.5	80.4	97	280 8	96.7
48	45.4	15.6	98	92.7	31.9	48	139.9	48.2	98	187.2	64.5	48	234.5	80.7	98	281.7	97.0
49	46.3	16.0	99	93.6	32.2	49	140.9	48.5	99	188.1	64.8	49	235.4	81.1	99	282 7	97.4
50	47.3	16.3	100	94.5	32.6	150	141.8	48.8	200	189.1	65,1	250	236.4	81.4	300	283.6	97.7
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Lat	Dep

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep
1	00,9	00.3	51	47.9	17.4	101	94.9	34.5	151	141.9	51.6	201	188.9	68.7	251	235.9	85.8
2	01.9	00.7	52	48.9	17.8	02	95.8	34.9	52	142.8	52.0	02	189.8	63.1	52	236.8	86.2
3	02.8	01.0	53	49.8	18.1	03	96.8	35.2	53	143 8	52.3	03	190.8	69.4	53	237.7	86.5
4	03.8	01.4	54	50.7	18.5	04	97.7	35.6	54	144.7	52.7	04	19.17	69.8	54	238.7	86.9
5	04.7	01.7	55	51.7	18.8	05	98.7	35.9	55	145.7	53.0	05	192.6	70.1	55	239.6	87.2
6	05.6	02.1	56	52.6	19.2	106	99.6	36.3	156	146.6	53.4	206	193.6	70.5	256	240.6	87.6
7	06.6	02.4	57	53.6	19.5	07	100.5	36.6	57	147.5	53.7	07	194.5	70.8	57	241.5	87.9
8	07.5	02.7	58	54.5	19.8	08	101.5	36.9	58	148.5	54.0	08	195.5	71.1	58	242.4	88.2
9	08,5	03.1	59	55.4	20.2	09	102.4	37.3	59	149.4	54.4	09	196.4	71.5	59	243.4	88.6
10	09.4	03.4	60	56.4	20.5	10	103.4	37.6	60	150.4	54.7	10	197.3	71.8	60	244.3	88 9
11	10.3	03.8	61	57.3	20.9	111	104.3	38.0	161	151.3	55.1	211	198.3	72.2	261	245.3	89.3
12	11.3	04.1	62	58.3	21.2	12	105.2	38.3	62	152.2	55.4	12	199.2	72.5	62	246.2	89.6
13	12.2	04.4	63	59.2	21.5	13	106.2	38.6	63	153.2	55.7	13	200.2	72.8	63	247.1	89.9
14	13.2	04.8	64	60.1	21.9	14	107.1	39.0	64	154.1	56.1	14	201.1	73.2	64	248.1	90.3
15	14.1	05.1	65	61.1	22.2	15	108.1	39.3	65	155.1	56.4	15	202.0	73.5	65	249.0	90.6
16	15.0	05.5	66	62.0	22.6	116	109.0	39.7	166	156.0	56.8	216	203.0	73.9	266	250.0	91.0
17	16.0	05.8	67	63.0	22.9	17	09.9	40.0	67	156.9	57.1	17	203.9	74.2	67	250.9	91.3
18	16.9	06.2	68	63.9	23.3	18	110.9	40.4	68	157.9	57.5	18	204.9	74.6	68	251.8	91.7
19	17.9	06.5	69	64.8	23.6	19	111.8	40.7	69	158.8	57 8	19	205.8	74.9	69	252.8	92.0
20	18.8	06.8	70	65.8	23.9	20	112.8	41.0	70	159.7	58.1	20	206,-	75.2	70	253.7	92.3
21	19.7	07.2	71	66.7	24.3	121	113.7	41.4	171	160.7	58.5	121	207.7	75 6	271	254.7	92.7
22	20.7	07.6	72	67.7	24.6	22	114.6	41.7	72	161.6	58.8	22	208.6	75.9	72	255.6	93.0
23	21.6	07.9	73	68.6	25.0	23	115.6	42.1	73	162.6	58.2	23	209.6	76.3	73	256.5	93.4
24	22.6	08.2	74	69.5	25.3	24	116.5	42.4	74	163.5	59.5	24	210.5	76.6	74	257.4	93.7
25	23.5	08.6	75	70.5	25.7	25	117.5	42.8	75	164.4	59.9	25	211.4	77.0	75	258.4	94.1
26	24.4	08.9	76	71.4	26.0	126	118.4	43.1	176	165.4	60.2	226	212.4	77.3	276	259.4	94.4
27	25.4	09.2	77	72.4	26.3	27	119.3	43.4	77	166.3	60.5	27	213.3	77.6	77	260.3	94.7
28	26.3	09.6	78	73.3	26.7	28	120.3	43.8	78	167.3	60.9	28	214.3	78.0	78	261.2	95.1
29	27.3	09.9	79	74.2	27.0	29	121.2	44.1	79	168.2	61.2	29	215.2	78.3	79	262,2	95.4
30	28.2	10.3	80	75.2	27.4	30	122.2	44.5	80	169.1	61.6	30	216.1	78.7	80	263.1	95.8
31	29.1	10.6	81	76.1	27.7	131	123.1	44.8	181	170.1	61.9	231	217.1	79.0	281	264.1	96.1
32	30.1	10.9	82	77.1	28.0	32	124.0	45.1	82	171.0	62.2	32	218.0	79.3	82	265.0	96.4
33	31.0	11.3	83	78.0	28.4	33	125.0	45.5	83	172.0	62.6	33	219.0	79.7	83	265.9	96.8
34	31.9	11.6	84	78.9	28.7	34	125.9	45.8	84	172.9	62.9	34	219.9	80.0	84	266.9	97,1
35	32.9	12.0	85	79.9	29.1	35	126.9	46.2	85	173.8	63.3	35	220.8	80 4	85	267.8	97.5
36	33.8	12.3	86	80.8	29.4	136	127.8	46.5	186	174.8	63.6	236	221.8	80.7	286	268.8	97.8
37	34.8	12.7	87	81.8	29.8	37	128.7	46.9	87	175.7	64.0	37	222 7	81.1	87	269.7	98.2
38	35.7	13.0	88	82.7	30.1	38	129.7	47.2	88	176.7	64.3	38	223.6	81.4	88	270.6	98.5
39	36.6	13.3	89	83.6	30.4	39	130.6	47.5	89	177.6	64.6	39	224.6	81.7	89	271.6	98.8
40	37.6	13.7	90	84.6	30.8	40	131.6	47.9	90	178.5	65 0	40	225.5	82.1	90	272.5	99.2
41	38.5	14.0	91	85.5	31.1	141	132.5	48.2	191	179.5	65.3	241	226.5	82.4	291	273.5	99.5
42	39.5	14.4	92	86.5	31.5	42	133.4	48.6	92	180.4	65.7	42	227.4	82.8	92	274.4	99.9
43	40.4	14.7	93	87.4	31.8	43	134.4	48.9	93	181.4	66.0	43	228.3	83.1	93	275,3	100.2
44	41.3	15.0	94	88.3	32.1	44	135.3	49.2	94	182.3	66.3	44	229.3	83.4	94	276.3	100.5
45	42.3	15.4	95	89.3	32.5	45	136.3	49.6	95	183.2	66.7	45	230.2	83.8	95	277.2	100.9
46	43,2	15.7	96	90.2	32.8	146	137.2	49.9	196	184.2	67.0	246	231.2	84.1	296	278.2	101.1
47	44.2	16.1	97	91.2	33.2	47	138.1	50.3	97	185.1	67.4	47	232.1	84.5	97	279.1	101.6
48	45.1	16.4	98	92.1	33.5	48	139.1	50.6	98	186.1	67.7	48	233.0	84,8	98	280.0	101.9
49	46.0	16.8	99	93.0	33.9	49	140.0	51.0	99	187.0	68.1	49	234.0	85.2	99	281.0	102.3
50	47.0	17.1	100	94.0	34.2	150	141 0	51.3	200	187.9	68.4	250	234.9	85.5	300	281.9	102.6
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	00.9	00.4	51	47.6	18.3	101	94.3	36.2	151	141.0	54.1	201	187.6	72.0	251	234.3	90,0
2	01.9	00.7	52	48.5	18.6	02	95,3	36.6	52	141.9	54.5	02	188.6	72.4	52	235.3	90.3
3	02.8	01.1	53	49.5	19.0	03	96.2	36.9	53	142.9	54.8	03	189.5	72.8	53	236.2	90.7
4	03.7	01.4	54	50.4	19.4	04	97.1	37.3	54	143.8	55.2	04	190.4	73.1	54	237,1	91.0
5	04.7	01,8	55	51.3	19.7	05	98.1	37.6	55	144.7	55.6	05	191.4	73.5	55	238.1	91.4
6	05.6	02.2	56	52.3	20.1	106	99,0	38.0	156	145.7	55.9	206	192.3	73.8	256	239.0	91.8
7	06.5	02,5	57	53.2	20.4	07	99.9	38.3	57	146.6	56.3	07	193.2	74.2	57	239.9	92.1
8	07.5	02.9	58	54.1	20.8	08	100.9	38.7	58	147.5	56.6	08	194.2	74.5	58	240.9	92.5
9	08.4	03.2	59	55.1	21.1	09	101.8	39,1	59	148.5	57.0	09	195.1	74.9	59	241.8	92.8
10	09.3	03.6	60	56.0	21.5	10	102.7	39.4	60	149.4	57.3	10	196.0	75.3	60	242.7	93.2
11	10.3	03.9	61	56.9	21.9	111	103.7	39.8	161	150.3	57.7	211	197.0	75,6	261	243.7	93.5
12	11.2	04.3	62	57.9	22.2	12	104.6	40.1	62	151.3	58.1	12	197.9	76.0	62	244.6	93.9
13	12.1	04.7	63	58.8	22.6	13	105.5	40.5	63	152.2	58.4	13	198.8	76.3	63	245.5	94.3
14	13.1	05.0	64	59.7	22.9	14	106.5	40,9	64	153.1	58.8	14	199.8	76.7	64	246.5	94.6
15	14.0	05.4	65	60.7	23.3	15	107.4	41.2	65	154.1	59.1	15	200.7	77.1	65	247.4	95.0
16	14.9	05.7	66	61.6	23.7	116	108.3	41.6	166	155.0	59.5	216	201.6	77.4	266	248.3	95.3
17	15.9	06.1	67	62.5	24.0	17	109.3	41.9	67	155.9	59.9	17	202.6	77.8	67	249.3	95.7
18	16.8	06.5	68	63.5	24.4	18	110.2	42.3	68	156.9	60.2	18	203.5	78.1	68	250.2	96.1
19	17.7	06.8	69	64.4	24.7	19	111.1	42.6	69	157.8	60.6	19	204.4	78.5	69	251.1	96.4
20	18.7	07.2	70	65.3	25.1	20	112.1	43,0	70	158.7	60.0	20	205.4	78.8	70	252.1	96.8
21	19.6	07.5	71	66.3	25.4	121	113.0	43.4	171	159.7	61.3	221	206.3	79.2	271	253.0	97.1
22	20.5	07.9	72	67.2	25.8	22	113.9	43.7	72	160.6	61.6	22	207.2	79.6	72	253.9	97.5
23	21.5	08.2	73	68.1	26.2	23	114.9	44,1	73	161.5	62.0	23	208.2	79.9	73	254.9	97.8
24	22.4	08.6	74	69.1	26.5	24	115.8	44.4	74	162.5	62.4	24	209.1	80.3	74	255.8	98.2
25	23.3	09.0	75	70.0	26.9	25	116.7	44.8	75	163.4	62.7	25	210.0	80.6	75	256,7	98.6
26	24.3	09,3	76	70.9	27.2	126	117.7	45.2	176	164.3	63.1	226	211.0	81.0	276	257.7	98.9
27	25.2	09.7	77	71.9	27.6	27	118.6	45.5	77	165.3	63.4	27	211.9	81.4	77	258.6	99.3
28	26.1	10.0	78	72.8	28.0	28	119.5	45.9	78	166.2	63.8	28	212.8	81.7	78	259.5	99.6
29	27.1	10.4	79	73.7	28.3	29	120.5	46.2	79	167.1	6.42	29	213.8	82.1	79	260.5	100.0
30	28.0	10.8	80	74.7	28.7	30	121.4	46.6	80	168.1	64.5	30	214.7	82.4	80	261.4	100.4
31	28.9	11.1	81	75.6	29.0	131	122.3	47.0	181	169.0	64.9	231	215.6	82.8	281	262.3	100.7
32	29.9	11.5	82	76.5	29.4	32	123.3	47.3	82	169.9	65,2	32	216.6	83.1	82	263.3	101.1
33	30.8	11.8	83	77.5	29.7	33	124.2	47.7	83	170.9	65.6	33	217.5	83.5	83	264.2	101.4
34	31.7	12.2	84	78.4	30.1	34	125.1	48.0	84	171.8	65.9	34	218.4	83.9	84	265.1	101.8
35	32.7	12.5	85	79.3	30.5	35	126.1	48.4	85	172.7	66.3	35	219.4	84.2	85	266.1	102.1
36	33.6	12.9	86	80.3	30.8	136	127.0	48.7	186	173.7	66.7	236	220.3	84.6	286	267.0	102.5
37	34.5	13.3	87	81.2	31.2	37	127.9	49.1	87	174.6	67.0	37	221.2	84.9	87	267.9	102.9
38	35.5	13.6	88	82.1	31.5	38	128,9	49.5	88	175.5	67.4	38	222.2	85.3	88	268.9	103.2
39	36.4	14.0	89	83.1	31.9	39	129.8	49.8	89	176.5	67.7	39	223.1	85.7	89	269.8	103.6
40	37.3	14.3	90	84.0	32.3	40	130.7	50.2	90	177.4	68.1	40	224.1	86.0	90	270.7	103.9
41	38.3	14.7	91	84.9	32.6	141	131.7	50.5	191	178.3	68.5	241	225.0	86.4	291	271.7	104.3
42	39.2	15.1	92	85.9	33.0	42	132.6	50.9	92	179.3	68.8	42	225.9	86.7	92	272.6	104.7
43	40.1	15.4	93	86.8	33.3	43	133.5	51.3	93	180.2	69.2	43	226.9	87.1	93	273.5	105.0
44	41.1	15.8	94	87.7	33.7	44	134.5	51.6	94	181.1	69.5	44	227.8	87.4	94	274.5	105.4
45	42.0	16.1	95	88.7	34.0	45	135.4	52.0	95	182.1	69.9	45	228.7	87.8	95	275.4	105.7
46	42.9	16.5	96	89.6	34.4	146	136.3	52.3	196	183.0	70.2	246	229,7	88.2	296	276.3	106.1
47	43.9	16.8	97	90.5	34.8	47	137.3	52.7	97	183.9	70.6	47	230.6	88.5	97	277.3	106.4
48	44.8	17.2	98	91.5	35.1	48	138.2	53.0	98	184.9	71.0	48	231.5	88.9	98	278.2	106.8
49	45.7	17.6	99	92.4	35.5	49	139.1	53 4	99	185.8	71.3	49	232.5	89.2	99	279.1	107.2
50	46.7	17.9	100	93.4	35.8	150	140.1	53.8	200	186.7	71.7	250	233.4	89.6	300	280.1	117.5
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Lat	Dep

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.9	00.4	51	47.3	19.1	101	93.6	37.8	151	140.0	56.6	201	186.4	75.3	251	232.7	95.0
2	01.9	00.7	52	48.2	19.5	02	94.6	38.2	52	140.9	56.9	02	187.3	75.7	52	233.7	94.4
3	02.8	01.1	53	49.1	19.9	03	95.5	38.6	53	141.9	57.3	03	188.2	76.0	53	234.6	94.8
4	03.7	01.5	54	50.1	20.2	04	96.4	39.0	54	142.8	57.7	04	189.1	76.4	54	235.5	95.2
5	04.6	01.9	55	51.0	20.6	05	97.4	39.3	55	143.7	58.1	05	190.1	76.8	55	236.4	95.5
6	05.6	02.2	56	51.9	21.0	106	98.3	39.7	156	144.6	58.4	206	191.0	77.2	256	237.4	95.9
7	06.5	02.6	57	52.9	21.4	07	99.2	40.1	57	145.6	58.8	07	191.9	77.5	57	238.3	96.3
8	07.4	03.0	58	53.8	21.7	08	100.1	40.5	58	146.5	59.2	08	192.9	77.9	58	239.2	96.6
9	08.3	03.4	59	54.7	22.1	09	101.1	40.8	59	147.4	59.6	09	193.8	78.3	59	240.1	97.0
10	09.3	03.7	60	55.6	22.5	10	102.0	41.2	60	148.4	59.9	10	194.7	78.7	60	241.1	97.4
11	10.2	04.1	61	56.6	22.9	111	102.9	41.6	161	149.3	60.3	211	195,6	79.0	261	242.0	97.8
12	11.1	04.5	62	57.5	23.2	12	103.8	42.0	62	150.2	60.7	12	196.6	79.4	62	242.9	98.1
13	12.1	04.9	63	58.4	23.6	13	104.8	42.3	63	151.1	61.1	13	197.5	79.8	63	243.9	98.5
14	13.0	05.2	64	59.3	24.0	14	105.7	42.7	64	152.1	61.4	14	198.4	80.2	64	244.8	98.9
15	13.9	05.6	65	60.3	24.3	15	106.6	43.1	65	153.0	61.8	15	199.3	80.5	65	245.7	99.3
16	14.8	06.0	66	61.2	24.7	116	107.6	43.5	166	153.9	62.2	216	200.3	80.9	266	246.6	99.6
17	15.8	06.4	67	62.1	25.1	17	108.5	43.8	67	154.8	62.6	17	201.2	81.3	67	247.6	100.0
18	16.7	06.7	68	63.0	25.5	18	109.4	44.2	68	155.8	62,9	18	202.1	81.7	68	248.5	100.4
19	17.6	07.1	69	64.0	25.8	19	110.3	44.6	69	156.7	63.3	19	203.1	82.0	69	249.4	100.8
20	18.5	07.5	70	64.9	26.2	20	111.3	45.0	70	157.6	63.7	20	204.0	82.4	70	250.3	101.1
21	19.5	07.9	71	65.8	26.6	121	112.2	45.3	171	158.6	64.1	221	204.9	82.8	271	251.3	101.5
22	20.4	08.2	72	66.8	27.0	22	113.1	45.7	72	159.5	64.4	22	205.8	83.2	72	252.2	101.9
23	21.3	08.6	73	67.7	27.3	23	114.0	46.1	73	160.4	64.8	23	206.7	83.5	73	253.1	102.3
24	22.3	09.0	74	68.6	27.7	24	115.0	46.5	74	161.3	65.2	24	207.7	83.9	74	254.1	102.6
25	23.2	09.4	75	69.5	28.1	25	115.9	46.8	75	162.3	65.6	25	208 6	84.3	75	255.0	103.0
26	24.1	09.7	76	70.5	28.5	126	116.8	47.2	176	163 2	65.9	226	209.5	84.7	276	255 9	103 4
27	25.0	10.1	77	71.4	28.8	27	117.8	47.6	77	164,1	66.3	27	210.5	85.0	77	256.8	103.8
28	26.0	10.5	78	72.3	29.2	28	118.7	47.9	78	165.0	66.7	28	211.4	85.4	78	257.8	104.1
29	26.9	10.9	79	73.2	29.6	29	119.6	48.3	79	166.0	67.1	29	212.3	85.8	79	258.7	104.5
30	27.8	11.2	80	74.2	30.0	30	120.5	48.7	80	166.9	67.4	30	213.3	86.2	80	259.6	104.9
31	28.7	11.6	81	75.1	30,3	131	121.5	49.1	181	167.8	67.8	231	214.2	86.5	281	260.5	105.3
32	29.7	12.0	82	76.0	30.7	32	122.4	49.4	82	168.8	68.2	32	215.1	86.9	82	261.5	105.6
33	30.6	12.4	83	77.0	31.1	33	123.3	49.8	83	169.7	68.6	33	216.0	87.3	83	262.4	106.0
34	31.5	12.7	84	77.9	31.5	34	124.2	50.2	84	170.6	68.9	34	217.0	87.7	84	263,3	106.4
35	32.5	13.1	85	78.8	31.8	35	125.2	50.6	85	171.5	69.3	35	217.9	88.0	85	264.3	106.8
36	33.4	13.5	86	79.7	32.2	136	126.1	50.9	186	172.5	69.7	236	218.8	88.4	286	265.2	107.1
37	34.3	13.9	87	80.7	32.6	37	127.0	51.3	87	173.4	70.1	37	219.7	88.8	87	266.1	107.5
38	35.2	14.2	88	81.6	33.0	38	128.0	51.7	88	174.3	70,4	38	220.7	89.2	88	267.0	107.9
39	36.2	14.6	89	82.5	33.3	39	128.9	52.1	89	175.2	70.8	39	221,6	89.5	89	268.0	108.3
40	37.1	15.0	90	83.4	33.7	40	129.8	52.4	90	176.2	71.2	40	222.5	89.9	90	268.9	108.6
41	38.0	15.4	91	84.4	34.1	141	130.7	52.8	191	177.1	71.5	241	223.5	90.3	291	269.8	109.0
42	38.9	15.7	92	85.3	34.5	42	131.7	53.2	92	178.0	71.9	42	224.4	90.7	92	270,7	109,4
43	39.9	16.1	93	86.2	34.8	43	132.6	53.6	93	178.9	72.3	43	225.3	91.0	93	271.7	109.8
44	40.8	16.5	94	87.2	35,2	44	133.5	53.9	94	179.8	72.7	44	226.2	91.4	94	272.6	110.1
45	41.7	16.9	95	88.1	35.6	45	134.4	54.3	95	180.8	73.0	45	227.2	91.8	95	273.5	110.5
46	42.7	17.2	96	89.0	36.0	146	135.4	54.7	196	181.7	73.4	246	228.1	92.2	296	274.5	110.9
47	43.6	17.6	97	89.9	36.3	47	136.3	55.1	97	182.7	73.8	47	229,0	92.5	97	265.4	111.3
48	44.5	18.0	98	90.9	36.7	48	137.2	55.4	98	183.6	74.2	48	229.9	92.9	98	276.3	111.6
49	45.4	18.4	99	91.8	37.1	49	138.2	55.8	99	184.5	74.5	49	230.9	93.3	99	277.2	112.0
50	46.4	18.7	100	92.7	37.5	150	139.1	56.2	200	285.4	74.9	250	231.8	93.7	300	278.2	112.4
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.4	51	46.9	19.9	101	93.0	39.5	151	139.0	59.0	201	185.0	78.5	251	231.0	98.1
2	01.8	00.8	52	47.9	20.3	02	93.9	39.9	52	139.9	59.4	02	185.9	78.9	52	232.0	98.5
3	02.8	01.2	53	48.8	20.7	03	94.8	40.2	53	140.8	59.8	03	186.9	79.3	53	232.9	98.8
4	03.7	01.6	54	49.7	21.1	04	95.7	40.6	54	141.8	60.2	04	187.8	79.7	54	233.8	99.2
5	04.6	02.0	55	50.6	21.5	05	96.7	41.0	55	142.7	60.6	05	188.7	80.1	55	234.7	99.6
6	05.5	02.3	56	51.5	21.9	106	97.6	41.4	156	143.6	60.9	206	189.6	80.5	256	235.6	100.0
7	06.4	02.7	57	52.5	22.3	07	98.5	41.8	57	144.5	61.3	07	190.5	80.9	57	236.6	100.4
8	07.4	03.1	58	53.4	22.7	08	99.4	42.2	58	145.4	61.7	08	191.5	81.3	58	237.5	100.8
9	08.3	03.5	59	54.3	23.1	09	100.3	42.6	59	146.4	62.1	09	192.4	81.7	59	238.4	101.2
10	09.2	03.9	60	55.2	23.4	10	101.3	43.0	60	147.3	62.5	10	193.3	82.0	60	239.3	101.6
11	10.1	04.3	61	56.1	23.8	111	102.2	43.4	161	148.2	62.9	211	194.2	82.4	261	240.2	102.0
12	11.0	04.7	62	57.1	24.2	12	103.1	43.8	62	149.1	63.3	12	195.1	82.8	62	241.2	102.4
13	12.0	05.1	63	58.0	24.6	13	104.0	44.1	63	150.0	63.7	13	196.1	83.2	63	242.1	102.8
14	12.9	05.5	64	58.9	25.0	14	104.9	44.5	64	151.0	64.1	14	197.0	83.6	64	243.0	103.1
15	13.8	05.9	65	59.8	25.4	15	105.9	44.9	65	151.9	64.5	15	197.9	84.0	65	243.9	103.5
16	14.7	06.3	66	60.8	25.8	16	106.8	45.3	166	152.8	64.9	216	198.8	84.4	266	244.9	103.9
17	15.6	06.6	67	61.7	26.2	17	107.7	45.7	67	153.7	65.2	17	199.7	84.8	67	245.8	104.3
18	16.6	07.0	68	62.6	26.6	18	108.6	46.1	68	154.6	65.6	18	200.7	85.2	68	246.7	104.7
19	17.5	07.4	69	63.5	27.0	19	109.5	46.5	69	155.6	66.0	19	201.6	85.6	69	247.6	105.1
20	18.4	07.8	70	64.4	27.3	20	110.5	46.9	70	156.5	66.4	20	202.5	86.0	70	248.5	105.5
21	19.3	08.2	71	65.4	27.7	121	111.4	47.3	171	157.4	66.8	221	203.4	86.3	271	249.5	105.9
22	20.3	08.6	72	66.3	28.1	22	112.3	47.7	72	158.3	67.2	22	204.4	86.7	72	250.4	106.3
23	21.2	09.0	73	67.2	28.5	23	113.2	48.1	73	159.2	67.6	23	205.3	87.1	73	251.3	106.7
24	22.1	09.4	74	68.1	28.9	24	114.1	48.4	74	160.2	68.0	24	206.2	87.5	74	252.2	107.1
25	23.0	09.8	75	69.0	29.3	25	115.1	48.8	75	161.1	68.4	25	207.1	87.9	75	253.1	107.4
26	23.9	10.2	76	70.0	29.7	126	116.0	49.2	176	162.0	68.8	226	208.0	88.3	276	254.1	107.8
27	24.9	10.5	77	70.9	30.1	27	116.9	49.6	77	162.9	69.2	27	209.0	88.7	77	255.0	108.2
28	25.8	10.9	78	71.8	30.5	28	117.8	50.0	78	163.8	69.5	28	209.9	89.1	78	255.9	108.6
29	26.7	11.3	79	72.7	30.9	29	118.7	50.4	79	164.8	69.9	29	210.8	89.5	79	256.8	109.0
30	27.6	11.7	80	73.6	31.3	30	119.7	50.8	80	165.7	70.3	30	211.7	89.9	80	257.7	109.4
31	28.5	12.1	81	74.6	31.6	131	120.6	51.2	181	166.6	70.7	231	212.6	90.3	281	258.7	109.8
32	29.5	12.5	82	75.5	32.0	32	121.5	51.6	82	167.5	71.1	32	213.6	90.6	82	259.6	110.2
33	30.4	12.9	83	76.4	32.4	33	122.4	52.0	83	168.5	71.5	33	214.5	91.0	83	260.5	110.6
34	31.3	13.3	84	77.3	32.8	34	123.3	52.4	84	169.4	71.9	34	215.4	91.4	84	261.4	111.0
35	32.2	13.7	85	78.2	33.2	35	124.3	52.7	85	170.3	72.3	35	216.3	91.8	85	262.3	111.3
36	33.1	14.1	86	79.2	33.6	136	125.2	53.1	186	171.2	72.7	236	217.2	92.2	286	263.3	111.7
37	34.1	14.5	87	80.1	34.0	37	126.1	53.5	87	172.1	73.1	37	218.2	92.6	87	264.2	112.1
38	35.0	14.8	88	81.0	34.4	38	127.0	53.9	88	173.1	73.5	38	219.1	93.0	88	265.1	112.5
39	35.9	15.2	89	81.9	34.8	39	127.9	54.3	89	174.0	73.8	39	220.0	93.4	89	266.0	112.9
40	36.8	15.6	90	82.8	35.2	40	128.9	54.7	90	174.9	74.2	40	220.9	93.8	90	266.9	113.3
41	37.7	16.0	91	83.8	35.6	141	129.8	55.1	191	175.8	74.6	241	221.8	94.2	291	267.9	113.7
42	38.7	16.4	92	84.7	35.9	42	130.7	55.5	92	176.7	75.0	42	222.8	94.5	92	268.8	114.1
43	39.6	16.8	93	85.6	36.7	43	131.6	55.9	93	177.7	75.4	43	223.7	94.9	93	269.7	114.5
44	40.5	17.2	94	86.5	36.3	44	132.6	56.3	94	178.6	75.8	44	224.6	95.3	94	270.6	114.9
45	41.4	17.6	95	87.4	37.1	45	133.5	56.7	95	179.5	76.2	45	225.5	95.7	95	271.5	115.3
46	42.3	18.0	96	88.4	37.5	146	134.4	57.0	196	180.4	76.6	246	226.4	96.1	296	272.5	115.6
47	43.3	18.4	97	89.3	37.9	47	135.3	57.4	97	181.3	77.0	47	227.4	96.5	97	273.4	116.0
48	44.2	18.8	98	90.2	38.3	48	136.2	57.8	98	182.3	77.4	48	228.3	96.9	98	274.3	116.4
49	45.1	19.1	99	91.1	38.7	49	137.2	58.2	99	183.2	77.7	49	229.2	97.3	99	275.2	116.8
50	46.0	19.5	100	92.0	39.1	50	138.1	58.6	200	184.1	78.1	50	230.1	97.7	300	276.2	117.2
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat.

Dist	Lat	Dep	Dist	La	Dep	Dist	La	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	La	ep
1	00.9	00.4	51	46.6	20:7	101	92.3	41.1	151	137.9	61.4	201	183.6	81.7	251	229.3	102.1
2	01.8	00.8	52	47.5	21.1	02	93.2	41.5	52	138.9	61.8	02	184.5	82.2	52	230.2	102.5
3	02.7	01.2	53	48.4	21.6	03	94.1	41.9	53	139.8	62.2	03	185.4	82.6	53	231.1	102.9
4	03.7	01.6	54	49.3	22.0	04	95.0	42.3	54	140.7	62.6	04	186.4	83.0	54	232.0	103.3
5	04.6	02.0	55	50.2	22.4	05	95.9	42.7	55	141.6	63.0	05	187.3	83.4	55	232.9	103.7
6	05.5	02.4	56	51.2	22.8	106	96.8	43.1	156	142.5	63.4	206	188.2	83.8	256	233.9	104.1
7	06.4	02.8	57	52.1	23.2	07	97.7	43.5	57	143.4	63.9	07	189.1	84.2	57	234.8	104.5
8	07.3	03.3	58	53.0	23.6	08	98.7	43.9	58	144.3	64.3	08	190.0	84.6	58	235.7	104.9
9	08.2	03.7	59	53.9	24.0	09	99.6	44.3	59	145.2	64.7	09	190.9	85.0	59	236.6	105.3
10	09.1	04.1	60	54.8	24.4	10	100.5	44.7	60	146.2	65.1	10	191.8	85.4	60	237.5	105.7
11	10.0	04.5	61	55.7	24.8	111	101.4	45.1	161	147.1	65.5	211	192.7	85.8	261	238.4	106.1
12	11.0	04.9	62	56.6	25.2	12	102.3	45.6	62	148.0	65.9	12	193.7	86.2	62	239.3	106.6
13	11.9	05.3	63	57.6	25.6	13	103.2	46.0	63	148.9	66.3	13	194.6	86.6	63	240.3	107.0
14	12.8	05.7	64	58.5	26.0	14	104.1	46.4	64	149.8	66.7	14	195.5	87.0	64	241.2	107.4
15	13.7	06.1	65	59.4	26.4	15	105.1	46.8	65	150.7	67.1	15	196.4	87.4	65	242.1	107.8
16	14.6	06.5	66	60.3	28.8	116	106.0	47.2	166	151.6	67.5	216	197.3	87.8	266	243.0	108.2
17	15.5	06.9	67	61.2	27.2	17	106.9	47.6	67	152.6	67.9	17	198.2	88.3	67	243.9	108.6
18	16.4	07.3	68	62.1	27.7	18	107.8	48.0	68	153.5	68.3	18	199.1	88.7	68	244.8	109.0
19	17.4	07.7	69	63.0	28.1	19	108.7	48.4	69	154.4	68.7	19	200.1	89.1	69	245.7	109,4
20	18.3	08.1	70	63.9	28.5	20	109.6	48.8	70	155.3	69.1	20	201.0	89.5	70	246.6	109.8
21	19.2	08.5	71	64.9	28.9	121	110.5	49.2	171	156.2	69.5	221	201.9	89.9	271	247.6	110.2
22	20.1	08.9	72	65.8	29.3	22	111.4	49.6	72	157.1	70.0	22	202.8	90.3	72	248.5	110.6
23	21.0	09.4	73	66.7	29.7	23	112.4	50.0	73	158.0	70,4	23	203.7	90.7	73	249.4	111.0
24	21.9	09.8	74	67.6	30.1	24	113.3	50.4	74	158.9	70.8	24	204.6	91.1	74	250.3	111.4
25	22.8	10.2	75	68.5	30,5	25	114.2	50.8	75	159.9	71.2	25	205.5	91.5	75	251.2	111.8
26	23.8	10.6	76	69.4	30.9	126	115.1	51.2	176	160.8	71.6	226	206.5	91.9	276	252.1	112.2
27	24.7	11.0	77	70.3	31.3	27	116.0	51.7	77	161.7	72.0	27	207.4	92.3	77	253.0	112.7
28	25.6	11.4	78	71.3	31.7	28	116.9	52.1	78	162.6	72.4	28	208.3	92.7	78	254.0	113.1
29	26.5	11.8	79	72.2	32.1	29	117.8	52.5	79	163.5	72.8	29	209.2	93.1	79	254 9	113.5
30	27.4	12.2	80	73.1	32.5	30	118.8	52.9	80	164,4	73.2	30	210.1	93.5	80	255.8	113.9
31	28.3	12.6	81	74.0	32.9	131	119.7	53.3	181	165.3	73.6	231	211,0	93.9	281	256.7	114.3
32	29.2	13.0	82	74.9	33.3	32	120.6	53.7	82	166.3	74.0	32	211.9	94.4	82	257.6	114.7
33	30.1	13.4	83	75.8	33.8	33	121.5	54.1	83	167.2	74.4	33	212.8	94.8	83	258.5	115.1
34	31.1	13.8	84	76.7	34 2	34	122.4	54.5	84	168.1	74.8	34	213.8	95.2	84	259.4	115.5
35	32.0	14.2	85	77.6	34.6	35	123.3	54.9	85	169.0	75.2	35	214.7	95.6	85	260.3	115.9
36	32.9	14.6	86	78.6	35.0	136	124.2	55.3	186	169.9	75.6	236	215.6	96.0	286	261.3	116.3
37	33.8	15.0	87	79.5	35,4	37	125.1	55.7	87	170.8	76.1	37	216.5	96.4	87	262.2	116.7
38	34.7	15.5	88	80.4	35.8	38	126.1	56.1	88	171.7	76.5	38	217.4	96.8	88	263,1	117.1
39	35.6	15.9	89	81.3	36.2	39	127.0	56.5	89	172.7	76.9	39	218.3	97.2	89	264.0	117.5
40	36.5	16.3	90	82.2	36.6	40	127.9	56.9	90	173.6	77.3	40	219.2	97.6	90	264.9	117.9
41	37.5	16.7	91	83.1	37.0	141	128.8	57.3	191	174.5	77.7	241	220.2	98.0	291	265.8	118.3
42	38.4	17.1	92	84.0	37.4	42	129.7	57.8	92	175.4	78.1	42	221,1	98.4	92	266.7	118,8
43	39.3	17.5	93	85.0	37.8	43	130.6	58.2	93	176.3	78.5	43	222.0	98.8	93	267.7	119.2
44	40.2	17.9	94	85.9	38.2	44	131.5	58.6	94	177.2	78.9	44	222.9	99.2	94	268.6	119.6
45	41.1	18.3	95	86.8	38.6	45	132.5	59.0	95	178.1	79.3	45	223.8	99.6	95	269.5	120.0
46	42.0	18.7	96	87.7	39.0	146	133.4	59.4	196	179.0	79.7	246	224.7	100.0	296	270,4	120.4
47	42.9	19.1	97	88.6	39.4	47	134.3	59.8	97	180.0	80.1	47	225.6	100.5	97	271.3	120.8
43	43.8	19.5	98	89.5	39.9	48	135.2	60.2	98	180.9	80.5	48	226.5	100.9	98	272.2	121.2
49	44.8	19.9	99	90.4	40.3	49	136.1	60.6	99	181.8	80.9	49	227.5	101.3	99	273.1	121.6
50	45.7	20.3	100	91.4	40.7	150	137.0	61.0	200	182.7	81.3	250	228.4	101.7	300	274.1	122.0
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.9	00.4	51	46.2	21.6	101	91.5	42.7	151	136.9	63.8	201	182.2	84.9	251	227.5	106.1
2	01.8	00.8	52	47.1	22.0	02	92.4	43.1	52	137.8	64.2	02	183.1	85.4	52	228.4	106.5
3	02.7	01.3	53	48.0	22.4	03	93.3	43.5	53	138.7	64.7	03	184.0	85.8	53	229.3	106.9
4	03.6	01.7	54	48.9	22.8	04	94.3	44.0	54	139.6	65.1	04	184.9	86.2	54	230.2	107.3
5	04.5	02.1	55	49.8	23.2	05	95.2	44.4	55	140.5	65.5	05	185.8	86.6	55	231.1	107.8
6	05.4	02.5	56	50.8	23.7	106	96.1	44.8	156	141.4	65.9	206	186.7	87.1	256	232.0	108.2
7	06.3	03.0	57	51.7	24.1	07	97.0	45.2	57	142.3	66.3	07	187.6	87.5	57	232.9	108.6
8	07.3	03.4	58	52.6	24.5	08	97.9	45.6	58	143.2	66.8	08	188.5	87.9	58	233.8	109.0
9	08.2	03.8	59	53.5	24.9	09	98.8	46.1	59	144.1	67.2	09	189.4	88.3	59	234.7	109.5
10	09.1	04.2	60	54.4	25.4	10	99.7	46.5	60	145.0	67.6	10	190.3	88.7	60	235.6	109.9
11	10.0	04.6	61	55.3	25.8	111	100.6	46.9	161	145.9	68.0	211	191.2	89.2	261	236.5	110.3
12	10.9	05.0	62	56.2	26.2	12	101.5	47.3	62	146.8	68.5	12	192.1	89.6	62	237.5	110.7
13	11.8	05.5	63	57.1	26.6	13	102.4	47.8	63	147.7	68.9	13	193.0	90.0	63	238.4	111.1
14	12.7	05.9	64	58.0	27.0	14	103.3	48.2	64	148.6	69.3	14	193.9	90.4	64	239.3	111.6
15	13.6	06.3	65	58.9	27.5	15	104.2	48.6	65	149.5	69.7	15	194.9	90.9	65	240.2	112.0
16	14.5	06.8	66	59.8	27.9	116	105.1	49.0	166	150.4	70.2	216	195.8	91.3	266	241.1	112.4
17	15.4	07.2	67	60.7	28.3	17	106.0	49.4	67	151.4	70,6	17	196.7	91.7	67	242.0	112.8
18	16.3	07.6	68	61.6	28.7	18	106.9	49.9	68	152.3	71.0	18	197.6	92.1	68	242.9	113.3
19	17.2	08.0	69	62.5	29.2	19	107.8	50.3	69	153.2	71.4	19	198.5	92.5	69	243.8	113.7
20	18.1	08.5	70	63.4	29.6	20	108.8	50.7	70	154.1	71.8	20	199.4	93.0	70	244.7	114.1
21	19.0	08.9	71	64.3	30.0	121	109.7	51.1	171	155.0	72.3	221	200.3	93.4	271	245.6	114.5
22	19.9	09.3	72	65.3	30,4	22	110.6	51.6	72	155.9	72.7	22	201.2	93.8	72	246.5	114.9
23	20.8	09.7	73	66.2	30.8	23	111.5	52.0	73	156.8	73.1	23	202.1	94.2	73	247.4	115.4
24	21.8	10.1	74	67.1	31.3	24	112.4	52.4	74	157.7	73.5	24	203.0	94.7	74	248.3	115.8
25	22.7	10.6	75	68.0	31.7	25	113.3	52.8	75	158.6	74.0	25	203.9	95.1	75	249.2	116.2
26	23.6	11.0	76	68.9	32.1	126	114.2	53.2	176	159.5	74.4	226	204.8	95.5	276	250.1	116.6
27	24.5	11.4	77	69.8	32.5	27	115.1	53.7	77	160.4	74.8	27	205.7	95.9	77	251.0	117.1
28	25.4	11.8	78	70.7	33.0	28	116.0	54.1	78	161.3	75.2	28	206.6	96.4	78	252.0	117.5
29	26.3	12.3	79	71.6	33.4	29	116.9	54.5	79	162.2	75.6	29	207.5	96.8	79	252.9	117.9
30	27.2	12.7	80	72.5	33.8	30	117.8	54.9	80	163.1	76.1	30	208.4	97.2	80	253.8	118.3
31	28.1	13.1	81	73.4	34.2	131	118.7	55.4	181	164,0	76.5	231	209.4	97.6	281	254.7	118,8
32	29.0	13.5	82	74.3	34.7	32	119.6	55.8	82	164.9	76.9	32	210.3	98.0	82	255.6	119.2
33	29.9	13.9	83	75.2	35.1	33	120.5	56.2	83	165.9	77.3	33	211.2	98.5	83	256.5	119.6
34	30.8	14.4	84	76.1	35,5	34	121.4	36.6	84	166.8	77.8	34	212.1	98.9	84	257.4	120.0
35	31.7	14.8	85	77.0	35.9	35	122.4	57.1	85	167.7	78.2	35	213,0	99.3	85	258.3	120.4
36	32.6	15.2	86	77.9	36.3	136	123.3	57.5	186	168.6	78.6	236	213.9	99.7	286	259.2	120.9
37	33.5	15.6	87	78.8	36.8	37	124.2	57.9	87	169.5	79.0	37	214.8	100.2	87	260.1	121.3
38	34.4	16.1	88	79.8	37.2	38	125.1	58.3	88	170.4	79.4	38	215.7	100.6	88	261.0	121.7
39	35.3	16.5	89	80.7	37.6	39	126.0	58.7	89	171.3	79.9	39	216.6	101.0	89	261.9	122.1
40	36.3	16.9	90	81.6	38.0	40	126.9	59.2	90	172.2	80.3	40	217.5	101.4	90	262.8	122.6
41	37.2	17.3	91	82.5	38.5	141	127.8	59.6	191	173.1	80.7	241	218.4	101.8	291	263,7	123.0
42	38.1	17.7	92	83.4	38.9	42	128.7	60.0	92	174.0	81.1	42	219.3	102.3	92	264.6	123.4
43	39.0	18.2	93	84.3	39.3	43	129.6	60.4	93	174.9	81.6	43	220.2	102.7	93	265.5	123.8
44	39.9	18.6	94	85.2	39.7	44	130.5	60.9	94	175.8	82.0	44	221,1	103.1	94	266.5	124.2
45	40.8	19.0	95	86.1	40.1	45	131.4	61.3	95	176.7	82.4	45	222.0	103.5	95	267.4	124.7
46	41.7	19.4	96	87.0	40.6	146	132.3	61.7	196	177.6	82.8	246	222.9	104.0	296	268.3	125.1
47	42.6	19.9	97	87.9	41.0	47	133.2	62.1	97	178.5	83.3	47	223.9	104.4	97	269.2	125.5
48	43.5	20.3	98	88.8	41.4	48	134.1	62.5	98	179.4	83.7	48	224.8	104.8	98	270,1	125.9
49	44.4	20.7	99	89.7	41.8	49	135.0	63.0	99	180.4	84.1	49	225.7	105.2	99	271.0	126.4
50	45.3	21.1	100	90.6	42.3	150	135.9	63.4	200	181.3	84.5	250	226.6	105.7	300	271.9	126.8
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.

for 65 Deg.

Difference of Latitude and Departure for 26 Deg.

Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	00.9	00.4	51	45.8	22.4	101	90.8	44.3	151	135.7	66.2	201	180.7	88.1	251	225.6	110.0
2	01.8	00.9	52	46.7	22,8	02	91.7	44,7	52	136.6	66.6	02	181.6	88.6	52	226.5	110.5
3	02.7	01.3	53	47.6	23.2	03	92.6	45.2	53	137.5	67.1	03	182.5	89.0	53	227.4	110.9
4	03.6	01.8	54	48.5	23.7	04	93.5	45.6	54	138.4	67.5	04	183.4	89.4	54	228.3	111.4
5	04.5	02,2	55	49.4	24.1	05	94.4	46.0	55	139.3	68.0	05	184.3	89.9	55	229.2	111.8
6	05.4	02.6	56	50.3	24.6	106	95,3	46.5	156	140.2	68.4	206	185.2	90.3	256	230.1	112.2
7	06.3	03.1	57	51.2	25.0	07	96.2	46.9	57	141.1	68.8	07	186.1	90.7	57	231.0	112.7
8	07.2	03.5	58	52.1	25.4	08	97.1	47.3	58	142.0	69.3	08	187.0	91.2	58	231.9	113.1
9	08.1	03.9	59	53.0	25.9	09	98.0	47.8	59	142.9	79.7	09	187.8	91.6	59	232.8	113.5
10	09.0	04.4	60	53.9	26.3	10	98.9	48.2	60	143.8	70.1	10	188.7	92.1	60	233.7	114.0
11	09.9	04.8	61	54.8	26.7	111	99,8	48.7	161	144.7	70.6	211	189.6	32.5	261	234.6	114.4
12	10.8	05.3	62	55.7	27.2	12	100.7	49.1	62	145.6	71.0	12	190.5	32.9	62	235.5	114.9
13	11.7	05.7	63	56.6	27.6	13	101.6	49.5	63	146.5	71.5	13	191.4	93.4	63	236.4	115.3
14	12.6	06.1	64	57.5	28.1	14	102.5	50.0	64	147.4	71 9	14	192.3	93.8	64	237,3	115.7
15	13.5	06.6	65	58.4	28.5	15	103.4	50.4	65	148.3	72.3	15	193.2	94.3	65	238.2	116.2
16	14.4	07.0	66	59.3	28.9	116	104.3	50.9	166	149.2	72.8	216	194.1	94.7	266	239.1	116.6
17	15.3	07.5	67	60.2	29.4	17	105.2	51.3	67	150.1	73.2	17	195.0	95.1	67	240.0	117.1
18	16.2	07.9	68	61.1	29.8	18	106.1	51.7	68	151.0	73.7	18	195.9	95.6	68	240.9	117.5
19	17.1	08.3	69	62.0	30.2	19	107.0	52.2	69	151.9	74.1	19	196.8	96.0	69	241.8	117.9
20	18.0	08.7	70	62.9	30.7	20	107.9	52.6	70	152.8	74.5	20	197.7	96.4	70	242.7	118.4
21	18.9	09.2	71	63.8	31.1	121	108.8	53.0	171	153.7	75.0	221	198.6	96.9	271	243.6	118.8
22	19.8	09,6	72	64.7	31.6	22	109.7	53.5	72	154.6	75.4	22	199.5	97.3	72	244.5	119.2
23	20.7	10.1	73	65.6	32.0	23	100.6	53.9	73	155.5	75.8	23	200.4	97.8	73	245.4	119.7
24	21.6	10.5	74	66.5	32.4	24	111.5	54.4	74	156.4	76.3	24	201.3	98.2	74	246.3	120,1
25	22.5	11.0	75	67.4	32.9	25	112.4	54.8	75	157.3	76.7	25	202.2	98.6	75	247.2	120.6
26	23.4	11.4	76	68.3	33.3	126	113.2	55.2	176	158.2	77.2	226	203.1	99.1	276	248.1	121.0
27	24.3	11,8	77	69.2	33.8	27	114.1	55.7	77	159.1	77.6	27	204.0	99.5	77	249.0	121.4
28	25.2	12.3	78	70.1	34.2	28	115.0	56.1	78	160.0	78.0	28	204.9	100.0	78	249.9	121.9
29	26.1	12.7	79	71.0	34.6	29	115.9	56.6	79	160.9	78.5	29	205.8	100.4	79	250.8	122.3
30	27.0	13.2	80	71.9	35.1	30	116.8	57.0	80	161.8	78.9	30	206.7	100.8	80	251.7	122.8
31	27.9	13.6	81	72.8	35.5	131	117.7	57.4	181	162.7	79.4	231	207.6	101.3	281	252.6	123.2
32	28.8	14.0	82	73.7	35.9	32	118.6	57.9	82	163.6	79.8	32	208.5	101.7	82	253.5	123.6
33	29.7	14.5	83	74.6	36.4	33	119.5	58.3	83	164.5	80.2	33	209.4	102.1	83	254.4	124.1
34	30.6	14.9	84	75.5	36.8	34	120.4	58.7	84	165.4	80.7	34	210.3	102.6	84	255.3	124.5
35	31.5	15.3	85	76.4	37.3	35	121.3	59.2	85	166.3	81.1	35	211.2	103.0	85	256,2	124.9
36	32.4	15.8	86	77.3	37.7	136	122.2	59.6	186	167.2	81.5	236	212.1	103.5	286	257.1	125.4
37	33.3	16.2	87	78.2	38,1	37	123.1	60.1	87	168.1	82.0	37	213.0	103.9	87	258.0	125.8
38	34.2	16.7	88	79.1	38.6	38	124.0	60.5	88	169.0	82.4	38	213.9	104.3	88	258.9	126.3
39	35.1	17.1	89	80.0	39.0	39	124.9	60.9	89	169.9	82.9	39	214.8	104.8	89	259.8	126.7
40	36.0	17.5	90	80.9	39.5	40	125.8	61.4	90	170.8	83.3	40	215.7	105.2	90	260.7	127.1
41	36 9	18.0	91	81.8	39.9	141	126.7	61.8	191	171.7	83.7	241	216.6	105.7	291	261.6	127.6
42	37.7	18.4	92	82.7	40.3	42	127.6	62.3	92	172.6	84.2	42	217.5	106.1	92	262.4	128.0
43	38.6	18.9	93	83.6	40.8	43	128,5	62.7	93	173.5	84.6	43	218.4	106.5	93	263.3	128.5
44	39.5	19.3	94	84.5	41.2	44	129.4	63,1	94	174.4	85.0	44	219.3	107.0	94	264.2	128.9
45	40.4	19.7	95	85.4	41.6	45	130.3	63.6	95	175.3	85,5	45	220.2	107.4	95	265.1	129.3
46	41.3	20.2	96	86.3	42.1	146	131.2	64,0	196	176.2	85.9	246	221.1	107.8	296	266.0	129.8
47	42.2	20.6	97	87.2	42.5	47	132,1	64.4	97	177,1	86.4	47	222.0	108.3	97	266.9	130.2
48	43.1	21.0	98	88.1	43.0	48	133.0	64.9	98	178.0	86.8	48	222.9	108.7	98	267.8	130.6
49	44.0	21.5	99	89.0	43.4	49	133.9	65.3	99	178.9	87.2	49	223.8	109.2	99	268.7	131.1
50	44.9	21.9	100	89.9	43.8	150	134.8	65.8	200	179.8	87.7	250	224.7	109.6	300	269.6	131.5
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Lat	Dep

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.9	00.5	51	35.4	23.2	101	90.0	45.9	151	134.5	68.6	201	179.1	91.3	251	223.6	114.0
2	01.8	00.9	52	46.3	23.6	02	90.9	46.3	52	135.4	69.0	02	180.0	91.7	52	224.5	114.4
3	02.7	01.4	53	47.2	24.1	03	91.8	46.8	53	136.3	69.5	03	180.9	92.2	53	225.4	114.9
4	03.6	01.8	54	48.1	24.5	04	92.7	47.2	54	137.2	69.9	04	181.8	92.6	54	226.3	115.3
5	04.5	02.3	55	49.0	25.0	05	93.6	47.7	55	138.1	70.4	05	182.7	93.1	55	227.2	115.8
6	05.3	02.7	56	49.9	25.4	106	94.4	48.1	156	139.0	70,8	206	183.5	93.5	256	228.1	116.2
7	06.2	03.2	57	50.8	25.9	07	95.3	48.6	57	139.9	71.3	07	184.4	94.0	57	229.0	116.7
8	07.1	03.6	58	51.7	26.3	08	96.2	49.0	58	140.8	71.7	08	185.3	94.4	58	229.9	117.1
9	08.0	04.1	59	52.6	26.8	09	97.1	49.5	59	141.7	72.2	09	186.2	94.9	59	230.8	117.6
10	08.9	04.5	60	53.5	27.2	10	98.0	49.9	60	142.6	72.6	10	187.1	95.3	60	231.7	118.0
11	09.8	05.0	61	54.4	27.7	111	98.9	50.4	161	143.5	73.1	211	188.0	95.8	261	232.6	118.5
12	10.7	05.4	62	55.2	28.1	12	99.8	50.8	62	144.3	73.5	12	188.9	96.2	62	233.4	118,9
13	11.6	05.9	63	56.1	28.6	13	100.7	51.3	63	145.2	74.0	13	189.8	96.7	63	234.3	119.4
14	12.5	06.4	64	57.0	29.1	14	101.6	51.8	64	146.1	74.5	14	190.7	97.2	64	235.2	119.9
15	13.4	06.8	65	57.9	29.5	15	102.5	52.2	65	147.0	74.9	15	191.6	97.6	65	236.1	120.3
16	14.3	07.3	66	58.8	30.0	116	103.4	52.7	166	147.9	75.4	216	192.5	98.1	266	237.0	120.8
17	15.1	07.7	67	59.7	30,4	17	104.2	53.1	67	148.8	75.8	17	193.3	98.5	67	237.9	121.2
18	16.0	08.2	68	60.6	30.9	18	105.1	53.6	68	149.7	76.3	18	194.2	99.0	68	238.8	121.7
19	16.9	08.6	69	61.5	31.3	19	106.0	54.0	69	150.6	76.7	19	195,1	99.4	69	239.7	122.1
20	17.8	09.1	70	62.4	31.8	20	106.9	54.5	70	151.5	77.2	20	196.0	99.9	70	240.6	122.6
21	18.7	09.5	71	63.3	32.2	121	107.8	54.9	171	152.4	77.6	221	196.9	100.3	271	241.5	123.3
22	19.6	10.0	72	64.2	32.7	22	108.7	55.4	72	153.3	78.1	22	197.8	100.8	72	242.4	123.5
23	20.5	10.4	73	65.0	33.1	23	109.6	55.8	73	154.1	78.5	23	198.7	101.2	73	243.2	123.9
24	21.4	10.9	74	65.9	33.6	24	110.5	56.3	74	155.0	79.0	24	199.6	101.7	74	244.1	124.4
25	22.3	11.4	75	66.8	34.1	25	111.4	36.8	75	155.9	79.4	25	200.5	102.2	75	245.0	124.9
26	23.2	11.8	76	67.7	34.5	126	112.3	57.2	176	156.8	79.9	226	201.4	102.6	276	245.9	125.3
27	24.1	12.3	77	68.6	35.0	27	113.2	57.7	77	157.7	80.4	27	202.3	103.1	77	246.8	125.8
28	24.9	12.7	78	69.5	35.4	28	114.0	58.1	78	158.6	80.8	28	203.1	103.5	78	247.7	126.2
29	25.8	13.2	79	70.4	35.9	29	114.9	58.6	79	159.5	81.3	29	204.0	104.0	79	248.6	126.7
30	26.7	13.6	80	71.3	36.3	30	115.8	59.0	80	160.4	81.7	30	204.9	104.4	80	249.5	127.1
31	27.6	14.1	81	72.2	36.8	131	116.7	59.5	181	161.3	82.2	231	205.8	104.9	281	250.4	127.6
32	28.5	14.5	82	73.1	37.2	32	117.6	59.9	82	162.2	82.6	32	206.7	105.3	82	251.3	128.0
33	29.4	15.0	83	74.0	37.7	33	118.5	60.4	83	163.1	83.1	33	207.6	105.8	83	252.2	128.5
34	30.3	15.4	84	74.8	38.1	34	119.4	60.8	84	163,9	83.5	34	208.5	106.2	84	253.0	128.9
35	31.2	15.9	85	75.7	38.6	35	120.3	61.3	85	164.8	84.0	35	209.4	106.7	85	253.9	129.4
36	32.1	16.3	86	76.6	39.0	136	121.2	61.7	186	165.7	84.4	236	210.3	107.1	286	254.8	129.8
37	33.0	16.8	87	77.5	39.5	37	122.1	62.2	87	166.6	84.9	37	211.2	107.6	87	255.7	130.3
38	33.9	17.3	88	78.4	40.0	38	123.0	62.7	88	167.5	85.4	38	212.1	108.1	88	256.6	130.8
39	34.7	17.7	89	79.3	40.4	39	123.8	63.1	89	168.4	85.8	39	212.9	108.5	89	257.5	131.2
40	35.6	18.2	90	80.2	40.9	40	124.7	63.6	90	169.3	86.3	40	213,8	109'0	90	258.4	131.7
41	36.5	18.6	91	81.1	41.3	141	125.6	64.0	191	170.2	86.7	241	214.7	109,4	291	259.3	132.1
42	37.4	19.1	92	82.0	41.8	42	126.5	64.5	92	171.1	87.2	42	215.6	109.9	92	260.2	132.6
43	38.3	19.5	93	82.9	42.2	43	127.4	64.9	93	172.0	87.6	43	216.5	110.3	93	261.1	133.0
44	39.2	20.0	94	83.8	42.7	44	128.3	65.4	94	172.9	88.1	44	217.4	110.8	94	262.0	133.5
45	40.1	20.4	95	84.6	43.1	45	129.2	65.8	95	173.7	88.5	45	218.3	111.2	95	262.8	133.9
46	41.0	20.9	96	85.5	43.6	146	130.1	66.3	196	174.6	89.0	246	219.2	111.7	296	263,7	134.4
47	41.9	21.3	97	86.4	44.0	47	131.0	66.7	97	175.5	89.4	47	220.1	112.1	97	264.6	134.8
48	42.8	21.8	98	87.3	44.5	48	131.9	67.2	98	176.4	89.9	48	221,0	112.6	98	265.5	135.3
49	43.7	22.2	99	88.2	44.9	49	132.8	67.6	99	177.3	90.3	49	221.9	113.0	99	266.4	135.7
50	44.6	22.7	100	89.1	45.4	150	133.7	68.1	200	178.2	90.8	250	222.8	113.5	300	267.3	136.2
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	00.9	00.5	51	45.0	23 9	101	89.2	47.4	151	133.3	70.9	201	177.5	94.4	251	221.6	117.8
2	01.8	00.9	52	45.9	24.4	02	90.1	47.9	52	134.2	71.4	02	178.4	94.8	52	222.5	118.3
3	02.6	01.4	53	46.8	24.9	03	90.9	48.4	53	135.1	71.8	03	179,2	95.3	53	223.4	118.8
4	03.5	01.9	54	47.7	25.4	04	91.8	48.8	54	136.0	72.3	04	180.1	95.8	54	224.3	119.2
5	04.4	02,3	55	48.6	25.8	05	92.7	49.3	55	136.9	72.8	05	181.0	96.2	55	225.2	119.7
6	05.3	02.8	56	49.4	26.3	106	93.6	49.8	156	137.7	73.2	206	181.9	96.7	256	226.0	120,2
7	06.2	03.3	57	50.3	26.8	07	94.5	50.2	57	138.6	73.7	07	182.8	97.2	57	226.9	120.7
8	07.1	03.8	58	51.2	27.2	08	95,4	50.7	58	139.5	74.2	08	183.7	97.7	58	227.8	121.1
9	07.9	04.2	59	52.1	27.7	09	96.2	51.2	59	140.4	74.6	09	184.5	98.1	59	228.7	121.6
10	08.8	04.7	60	53.0	28.2	10	97.1	51.6	60	141.3	75.1	10	185.4	98.6	60	229.6	122.1
11	09.7	05.2	61	53.9	28.6	111	98.0	52.1	161	142.2	75.6	211	186.3	99.1	261	230.5	122.5
12	10.6	05.6	62	54.7	29.1	12	98.9	52.6	62	143.0	76.1	12	187.2	99.5	62	231.3	123.0
13	11.5	06.1	63	55.6	29.6	13	99,8	53.1	63	143.9	76.5	13	188.1	100.0	63	232.2	123.5
14	12.4	06.6	64	56.4	30.0	14	100.7	53 5	64	144.8	77.0	14	189.0	100.5	64	233.1	123.9
15	13.2	07.0	65	57.5	30.5	15	101.5	54.0	65	145.7	77.5	15	189.8	100.9	65	234.0	124.4
16	14.1	07.5	66	58.3	31.0	116	102.4	54.5	166	146.6	77.9	216	190.7	101.4	266	234.9	124.9
17	15.0	08.0	67	59.2	31.5	17	103.3	54.9	67	147.5	78.4	17	191.6	101.9	67	235.8	125.4
18	15.9	08.5	68	60.0	31.9	18	104.2	55.4	68	148.3	78.9	18	192.5	102.4	68	236.6	125.8
19	16.8	08.9	69	60.9	32.4	19	105.1	55.9	69	149.2	79.3	19	193.4	102.8	69	237,5	126.3
20	17.7	09.4	70	61.8	32.9	20	106.0	56.3	70	150.1	79.8	20	194.3	103.3	70	238.4	126.8
21	18.5	09,9	71	62.7	33.3	121	106.8	56.8	171	151.0	80.3	221	195.1	103.8	271	239.3	127.2
22	19.4	10.3	72	63.6	33.8	22	107.7	57.3	72	151.9	80.8	22	196.0	104.2	72	240.2	127.7
23	20.3	10.8	73	64.5	34.3	23	108.6	57.7	73	152.8	81.2	23	196.9	104.7	73	241.1	128.2
24	21.2	11.3	74	65.3	34.7	24	109.5	58.2	74	153.6	81.7	24	197.8	105.2	74	241.9	128.6
25	22.1	11.7	75	66.2	35.2	25	110.4	58.7	75	154.5	82.2	25	198.7	105.6	75	242.8	129.1
26	23.0	12.2	76	67.1	35.7	126	111.3	59.2	176	155.4	82.6	226	199.6	106.1	276	243.7	129.6
27	23.8	12.7	77	68.0	36.2	27	112.1	59.6	77	156.3	83.1	27	200.4	106.6	77	244.6	130.1
28	24.7	13.1	78	68.9	36.6	28	113.0	60.1	78	157.2	83.6	28	201.3	107.0	78	245.5	130.5
29	25.6	13.6	79	69.8	37.1	29	113.9	60.6	79	158.1	84.0	29	202.2	107.5	79	246.4	131.0
30	26.5	14.1	80	70.6	37.6	30	114.8	61.0	80	158.9	84.5	30	203.1	108.0	80	247.2	131.5
31	27.4	14.6	81	71.5	38.0	131	115.7	61.5	181	159.8	85.0	231	204.0	108.5	281	248.1	131.9
32	28.3	15.0	82	72.4	38.5	32	116.6	62.0	82	160.7	85,4	32	204.9	108.9	82	249.0	132.4
33	29.1	15.5	83	73.3	39.0	33	117.4	62.4	83	161.6	85.9	33	205.7	109.4	83	249.9	132.9
34	30.0	16.0	84	75.2	39.4	34	118.3	62.9	84	162.5	86.4	34	206.6	109.9	84	250.8	133.3
35	30.9	16.4	85	74.1	39.9	35	119.2	63,4	85	163.4	86.9	35	207.5	110.3	85	251.7	133.8
36	31.8	16.9	86	75.9	40.4	136	120.1	63.9	186	164.2	87.3	236	208.4	110.8	286	252.5	134.3
37	32.7	17.4	87	76.8	40.8	37	121.0	64,3	87	165.1	87.8	37	209.3	111.3	87	253.4	134.7
38	33.6	17.8	88	77.7	41.3	38	121.9	64.8	88	166.0	88.3	38	210.2	111.7	88	254.3	135.2
39	34.4	18.3	89	78.6	41.8	39	122.7	65.3	89	166.5	88.7	39	211.0	112.2	89	255.2	135.7
40	35.3	18.8	90	79.5	42.3	40	123.6	65.7	90	167.8	89.2	40	211.9	112.7	90	256,1	136.2
41	36.2	19.2	91	80.4	42.7	141	124.5	66.2	191	168.7	89.7	241	212.8	113.1	291	257.0	136.6
42	37.1	19.7	92	81.2	43.2	42	125.4	66.7	92	169.5	90.1	42	213.7	113.6	92	257.8	137.1
43	38.0	20.2	93	82.1	43.7	43	126.3	67.1	93	170.4	90.6	43	214.6	114.1	93	258.7	137.6
44	38.9	20.7	94	83 0	44.1	44	127.2	67.6	94	171.3	91.1	44	215.5	114.6	94	259.6	138.0
45	39.7	21.1	95	83.9	44.6	45	128,0	68.1	95	172.2	91.6	45	216.3	115.0	95	260.5	138.5
46	40.6	21.6	96	84.8	45.1	146	128.9	68.5	196	173.1	92.0	246	217.2	115.5	296	261.4	139.0
47	41.5	22.1	97	85.7	45.5	47	129.8	69,0	97	174.0	92.5	47	218.1	115,9	97	262.3	139.4
48	42.4	22.5	98	86.5	46.0	48	130.7	69.5	98	174.8	93.0	48	219.0	116.4	98	263.1	139.9
49	43.3	23,0	99	87.4	46.5	49	131.6	70,0	99	175.7	93.4	49	219.9	116.9	99	264.0	140.4
50	44.2	23.5	100	88.3	47.0	150	132.5	70.4	200	176.6	93.9	250	220.8	117.4	300	264.9	140.9
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Lat	Dep

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.9	00.5	51	44.6	24.7	101	88.3	49.0	151	132.1	73.2	201	175.8	97.4	251	219.5	121.7
2	01.7	01.0	52	45.5	25.2	02	89.2	49,4	52	132.9	73.7	02	176.7	97.9	52	220.4	122.2
3	02.6	01.5	53	46.4	25.7	03	90.1	49.9	53	133.8	74.2	03	177.5	98.4	53	221.3	122.7
4	03.5	01.9	54	47.2	26.2	04	91.0	50.4	54	134.7	74.7	04	178.4	98.9	54	222.2	123,1
5	04.4	02.4	55	48.1	26.7	05	91,8	50.9	55	135.6	75.1	05	179.3	99.4	55	223.0	123.6
6	05.2	02.9	56	49.0	27.1	106	92.7	51.4	156	136.4	75.6	206	180.2	99.7	256	223.9	124.1
7	06.1	03.4	57	49.9	27.6	07	93.6	51.9	57	137.3	76.1	07	181.0	100.4	57	224.8	124.6
8	07.0	03.9	58	50.7	28.1	08	94 5	52.4	58	138.2	76.6	08	181.9	100.8	58	225.6	125.1
9	07.9	04.4	59	51.6	28.6	09	95,3	52.8	59	139.1	77.1	09	182.8	101.3	59	226.5	125.6
10	08.7	04.8	60	52.5	29.1	10	96.2	53.3	60	139.9	77.6	10	183.7	101.8	60	227.4	126.0
11	09.6	05.3	61	53.4	29.6	111	97.1	53.8	161	140.8	78.1	211	184.5	102.3	261	228.3	126.5
12	10.5	05.8	62	54.2	30 1	12	98.0	54 3	62	141.7	78.5	12	185.4	102.8	62	22 9.	127.0
13	11.4	06.3	63	55,1	30.5	13	98.8	54.8	63	142.6	79.0	13	186.3	103.3	63	230..0	127.5
14	12.2	06.8	64	56.0	31.0	14	99.7	55.3	64	143.4	79.5	14	187.2	103.7	64	230 .9	128.0
15	13.1	07.3	65	56.8	31.5	15	100.6	55.8	65	144.3	80.0	15	188.0	104.2	65	231.8	128.5
16	14.0	07.8	66	57.7	32.0	116	101.5	56.2	166	145.2	80.5	216	188.9	104.7	266	232.6	129.0
17	14.9	08.2	67	58.6	32.5	17	102.3	56.7	67	146.1	81.0	17	189.8	105,2	67	233.5	129,4
18	15.7	08.7	68	59.5	33.0	18	103.2	57.2	68	146.9	81.4	18	190.7	105.7	68	234.4	1.299
19	16.6	09.2	69	60.3	33.5	19	104.1	57.7	69	147.8	81.9	19	191.5	106.2	69	235.3	130.4
20	17.5	09.7	70	61,2	33.9	20	105.0	58,2	70	148.7	82.4	20	192.4	106.7	70	236.1	130.9
21	18.4	10.2	71	62.1	34.4	121	105.8	58.7	171	149.6	82.9	221	193.3	107.1	271	237.0	131.4
22	19.2	10.7	72	63.0	34.9	22	106.7	59.1	72	150.4	83.4	22	194.2	107.6	72	237.9	131.9
23	20.1	11.2	73	63.8	35.4	23	107.6	59.6	73	151.3	83.9	23	195.0	108.1	73	238.8	132.4
24	21.0	11.6	74	64.7	35.9	24	108.5	60.1	74	152.2	84.4	24	195.9	108.6	74	239.6	132.8
25	21.9	12.1	75	65.6	36.4	25	109.3	60.6	75	153.1	84.8	25	196.8	109.1	75	240.5	133.3
26	22.7	12.6	76	66.5	36.8	126	110.2	61.1	176	153.9	85.3	226	197.7	109.6	276	241.4	133.8
27	23 6	13.1	77	67.3	37.3	27	111.1	61.6	77	154.8	85.8	27	198.5	110.0	77	242.3	134.3
28	24.5	13.6	78	68.2	37.8	28	111.9	62.1	78	155.7	86.3	28	199.4	110.5	78	243.1	134.8
29	25 4	14.1	79	69.1	38.3	29	112.8	62.5	79	156.6	86.8	29	200.3	111.0	79	244.0	135.3
30	26.2	14.5	80	70.0	38.8	30	113.7	63.0	80	157.4	87.3	30	201.2	111.5	80	244.9	135.7
31	27.1	15.0	81	70.8	39.3	131	114.6	63.5	181	158.3	87.7	231	202.0	112.0	281	245.8	136.2
32	28.0	15.5	82	71.7	39.8	32	115.4	64.0	82	159.2	88.2	32	202.9	112.5	82	246.6	136.7
33	28.9	16.0	83	72.6	40.2	33	116.3	64.5	83	160.1	88.7	33	203.8	113.0	83	247.5	137.2
34	29.7	16.5	84	73.5	40.7	34	117.2	65.0	84	160.9	89.2	34	204.7	113.4	84	248.4	137.7
35	30.6	17.0	85	74.3	41.2	35	118.1	65.4	85	161.8	89.7	35	205.5	113 9	85	249.3	138,2
36	31.5	17.5	86	75.2	41.7	136	118.9	65.9	186	162.7	90.2	236	206.4	114.4	286	250.1	138.7
37	32.4	17.9	87	76.1	42.2	37	119.8	66.4	87	163.6	90.7	37	207.3	114.9	87	251.0	139.1
38	33.2	18.4	88	77.0	42.7	38	120.7	66.9	88	164.4	91.1	38	208.2	115.4	88	251.9	139.6
39	34.1	18.9	89	77.8	43.1	39	121.6	67.4	89	165.3	91.6	39	209.0	115.9	89	252.8	140.1
40	35.0	19.4	90	78.7	43.6	40	122.4	67.9	90	166.2	92.1	40	209.9	116.4	90	253.6	140.6
41	35.9	19.9	91	79.6	44.1	141	123.3	68.4	191	167.0	92.6	241	210.8	116.8	291	254.5	141.1
42	36.7	20.4	92	80.5	44.6	42	124,2	68.8	92	167.9	93.1	42	211.7	117.3	92	255 4	141.6
43	37.6	20.8	93	81.3	45.1	43	125.1	69.3	93	168.8	93.6	43	212.5	117.8	93	256.3	142.0
44	38.5	21.3	94	82.2	45.6	44	125.9	69.8	94	169.7	94.1	44	213.4	118.3	94	257.1	142.5
45	39.4	21.8	95	83.1	46.1	45	126.8	70.3	95	170.5	94.5	45	214.3	118.8	95	258.0	143.0
46	40.2	22.3	96	84.0	46.5	146	127.7	70.8	196	171.4	95.0	246	215.2	119.5	296	258.9	143.5
47	41.1	22.8	97	84.8	47.0	47	128.6	71,3	97	172.3	95.5	47	216.0	119.7	97	259.8	144.0
48	42.0	23.3	98	85.7	47.5	48	129.4	71 8	98	173.2	96.0	48	216.9	120.2	98	250.6	144.5
49	42.9	23.8	99	86.6	48.0	49	130.3	72.2	99	174.0	96.5	49	217.8	120.7	99	251.5	145.0
50	43.7	24.2	100	87.5	48.5	50	131.2	72.7	200	174.9	97,0	50	218.7	121.2	300	252.4	145.4
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat.

30 Difference of Latitude and Departure for 30 Deg.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep
1	00,9	00.5	51	44.2	25.5	101	87.5	50.5	151	130.8	75.5	201	174.1	100.5	251	217.4	125.5
2	01.7	01.0	52	45.0	26.0	02	88.3	51.0	52	131.6	76.0	02	174.9	101.0	52	218.2	126.0
3	02.6	01.5	53	45.9	26.5	03	89.2	51.5	53	132.5	76.5	03	175.8	101.5	53	219.1	126.5
4	03.5	02.0	54	46.8	27.0	04	90.1	52.0	54	133.4	77.0	04	176.7	102.0	54	220.0	127.0
5	04.3	02.5	55	47.6	27.5	05	90.9	52.5	55	134.2	77.5	05	177.5	102.5	55	220.8	127.5
6	05.2	03.0	56	48.5	28.0	106	91.8	53.0	156	135.1	78.0	206	178.4	103.0	256	221.7	128.0
7	06.1	03.5	57	49.4	28.5	07	92.7	53.5	57	136.0	78.5	07	179.3	103.5	57	222.6	128,5
8	06.9	04.0	58	50.2	29.0	08	93.5	54.0	58	136.8	79,0	08	180.1	104.0	58	223.4	129.0
9	07.8	04.5	59	51.1	29.5	09	94.4	54.5	59	137.7	79.5	09	181.0	104.5	59	224.3	129.5
10	08,7	05.0	60	52.0	30.0	10	95.3	55.0	60	138.6	80.0	10	181,9	105.0	60	225 2	130.0
11	09.5	05.5	61	52.8	30.5	111	96.1	55.5	161	139.4	80.5	211	182.7	105.5	261	226.0	130.5
12	10.4	06.0	62	53.7	31.0	12	97.0	56.0	62	140.3	81.0	12	183.6	106.0	62	226.9	131.0
13	11.3	06.5	63	54.6	31.5	13	97.9	56.5	63	141.2	81.5	13	184.5	106.5	63	227.8	131'5
14	12.1	07.0	64	55.4	32.0	14	98.7	57.0	64	142.0	82.0	14	185.3	107.0	64	228.6	132.0
15	13.0	07.5	65	56.3	32.5	15	99.6	57.5	65	142.9	82.5	15	186.2	107.5	65	229.5	132.5
16	13.9	08.0	66	57.2	33.0	116	100.5	58.0	166	143 8	83.0	216	187.1	108.0	266	230.4	133.0
17	14.7	08.5	67	58.0	33.5	17	101.3	58.5	67	144.6	83.5	17	187.9	108.5	67	231.2	133.5
18	15.6	09.0	68	58.9	34.0	18	102.2	59.0	68	145.5	84.0	18	188.8	109.0	68	232.1	134.0
19	16.5	09.5	69	59.8	34.5	19	103.1	59.5	69	146.4	84.5	19	189.7	109.5	69	233.0	134.5
20	17.3	10.0	70	60.6	35.0	20	103.9	60.0	70	147.2	85.0	20	190.5	110.0	70	233.8	135.0
21	18.2	10.5	71	61.5	35.5	121	104.8	60.5	171	148.1	85.5	121	191.4	110.5	271	234.7	135.5
22	19.1	11.0	72	62.4	36.0	22	105.7	61.0	72	149.0	86.0	22	192.3	111.0	72	235.6	136.0
23	19.9	11.5	73	63.2	36.5	23	106.5	61.5	73	149.8	86.5	23	193.1	111.5	73	236.4	136.5
24	20.8	12.0	74	64.1	37.0	24	107.4	62.0	74	150.7	87.0	24	194.0	112.0	74	237.3	137.0
25	21.7	12.5	75	65.0	37.5	25	108.3	62.5	75	151.6	87.5	25	194.9	112.5	75	238.2	137.5
26	22.5	13.0	76	65.8	38.0	126	109.1	63.0	176	152.4	88.0	226	195.7	113.0	276	239.0	138.0
27	23.4	13.5	77	66.7	38.5	27	110.0	63.5	77	153.3	88.5	27	196.6	113.5	77	239 9	138.5
28	24.2	14.0	78	67.5	39.0	28	110.8	64.0	78	154.1	89.0	28	197.4	114.0	78	240.7	139.0
29	25.1	14.5	79	68.4	39.5	29	111.7	64.5	79	155.0	89.5	29	198.3	114.5	79	241.6	139.5
30	26.0	15.0	80	69.3	40.0	30	112.6	65.0	80	155.9	90.0	30	199.2	115.0	80	242.5	140.0
31	26.8	15.5	81	70.1	40.5	131	113.4	65.5	181	156.7	90.5	231	200.0	115.5	281	243.3	140.5
32	27.7	16.0	82	71.0	41.0	32	114.3	66.0	82	157.6	91.0	32	200.9	116.0	82	244.2	141.0
33	28.6	16.5	83	71.9	41.5	33	115.2	66.5	83	158.5	91.5	33	201.8	116.5	83	245.1	141.5
34	29.4	17.0	84	72.7	42.0	34	116.0	67.0	84	159.3	92.0	34	202.6	117.0	84	245.9	142.0
35	30.3	17.5	85	73.6	42.5	35	116.9	67.5	85	160.2	92.5	35	203.5	117.5	85	246.8	142.5
36	31.2	18.0	86	74.5	43.0	136	117.8	68.0	186	161.1	93.0	236	204.4	118.0	286	247.7	143.0
37	32.0	18.5	87	75.3	43.5	37	118.6	68.5	87	161.9	93.5	37	205.2	118.5	87	248.5	143.5
38	32.9	19.0	88	76.2	44.0	38	119.5	69.0	88	162.8	94.0	38	206,1	119.0	88	249.4	144.0
39	33.8	19.5	89	77.1	44.5	39	120.4	69.5	89	163.7	94.5	39	207.0	119.5	89	250.3	144.5
40	34.6	20.0	90	77.9	45.0	40	121.2	70.0	90	164.5	95.0	40	207.8	120.0	90	251.1	145.0
41	35.5	20.5	91	78,8	45.5	141	122.1	70.5	191	165.4	95.5	241	208.7	120.5	291	252.0	145.5
42	36.4	21.0	92	79.7	46.0	42	123.0	71.0	92	166.3	96.0	42	209.6	121.0	92	252.9	146.0
43	37.2	21.5	93	80.5	46.5	43	123.8	71.5	93	167.1	96.5	43	210.4	121.5	93	253.7	146.5
44	38.1	22.0	94	81.4	47.0	44	124.7	72.0	94	168.0	97.0	44	211.3	122.0	94	254.6	147.0
45	39,0	22.5	95	82.3	47.5	45	125.6	72.5	95	168.9	97.5	45	212.2	122.5	95	255.5	147.5
46	39.8	23.0	96	83.1	48.0	146	126.4	73.0	196	169.7	98.0	246	213.0	123.0	296	256.3	148.0
47	40.7	23.5	97	84.0	48.5	47	127.3	73.5	97	170.6	98.5	47	213.9	123.5	97	257.2	148.5
48	41.6	24.0	98	84.9	49.0	48	128.2	74.0	98	171.5	99.0	48	214.8	124.0	98	258.1	149.0
49	42.4	24.5	99	85.7	49.5	49	129.0	74,5	99	172.3	99.5	49	215.6	124.5	99	258.9	149.5
50	43.3	25.0	100	86.6	50.0	150	129.9	75.0	200	173.2	100.0	250	216.5	125.0	300	259.8	150.0
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

for 60 Deg.

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.9	00.5	51	43.7	26.3	101	86,6	52.0	151	129.4	77.8	201	172.3	103.5	251	215.1	129.3
2	01.7	01.0	52	44.6	26.8	02	87.4	52.5	52	130.3	78.3	02	173.1	104.0	52	216.0	129,8
3	02.6	01.5	53	45.4	27.3	03	88.3	53.0	53	131.1	78.8	03	174.0	104.5	53	216.8	130.3
4	03.4	02.1	54	46.3	27.8	04	89.1	53.6	54	132.0	79.3	04	174.8	105,1	54	217.7	130.8
5	04.3	02.6	55	47.1	28.3	05	90.0	54 1	55	132.8	79.8	05	175.7	105.6	55	218.5	131.3
6	05.1	03.1	56	48.0	28.8	106	90.8	54.6	156	133.7	80.3	206	176.5	106.1	256	219.4	131.8
7	06.0	03.6	57	48.8	29.4	07	91.7	55.1	57	134.5	80.9	07	177.4	106.6	57	220.2	132.4
8	06.9	04.1	58	49.7	29.9	08	92.6	55.6	58	135.4	81.4	08	178.3	107.1	58	221.1	132.9
9	07.7	04.6	59	50.6	30.4	09	93.4	56.1	59	136.3	81.9	09	179.1	107.6	59	222.0	133.4
10	08.6	05.2	60	51.4	30.9	10	94.3	56.7	60	137.1	82.4	10	180.0	108.2	60	222.8	133.9
11	09.4	05.7	61	52.3	31.4	111	95,1	57.2	161	138.0	82.9	211	180.8	108.7	261	223.7	134.4
12	10.3	06.2	62	53.1	31.9	12	96.0	57.7	62	138.8	83.4	12	181.7	109.2	62	224.5	134.9
13	11.1	06.7	63	54.0	32.4	13	96.8	58,2	63	139.7	83.9	13	182.5	109.7	63	225.4	135.4
14	12.0	07.2	64	54.8	33.0	14	97.7	58.7	64	140.5	84.5	14	183.4	110.2	64	226.2	136.0
15	12.9	07.7	65	55.7	33.5	15	98.6	59.2	65	141.4	85.0	15	184.3	110.7	65	227.1	136.5
16	13.7	08.2	66	56.6	34.0	116	99,4	59.7	166	142.3	85.5	216	185.1	111.2	266	228.0	137.0
17	14.6	08.8	67	57.4	34.5	17	100.3	60.3	67	143.1	86.0	17	186.0	111.8	67	228.8	137.5
18	15.4	09.3	68	58.3	35.0	18	101.1	60.8	68	144.0	86.5	18	186.8	112.3	68	229.7	138,0
19	16.3	09.8	69	59.1	35.5	19	102.0	61.3	69	144.8	87.0	19	187.7	112.8	69	230.5	138.5
20	17.1	10.3	70	60.0	36.1	20	102.8	61.8	70	145.7	87.6	20	188.5	113.3	70	231.4	139.1
21	18.0	10.8	71	60.8	36.6	121	103.7	62.3	171	146.5	88.1	221	189.4	113.8	271	232.2	139.6
22	18.9	11.3	72	61,7	37.1	22	104.6	62.8	72	147.4	88.6	22	190.3	114.3	72	233.1	140.1
23	19.7	11.8	73	62.6	37.6	23	105.4	63.3	73	148.3	89.1	23	191.1	114.8	73	234.0	140.6
24	20.6	12.4	74	63.4	38.1	24	106.3	63.9	74	149.1	89.6	24	192.0	115.4	74	234.8	141.1
25	21.4	12.9	75	64.3	38.6	25	107.1	64.4	75	150.0	90.1	25	192.8	115.9	75	235.7	141.6
26	22.3	13.4	76	65.1	39.1	126	108.0	64.9	176	150.8	90.6	226	193.7	116.4	276	136.5	142.1
27	23.1	13.9	77	66.0	39.7	27	108.8	65.4	77	151.7	91.2	27	194.5	116.9	77	237.4	142.7
28	24.0	14.4	78	66.8	40.2	28	109.7	65.9	78	152.5	91.7	28	195.4	117.4	78	238.2	143.2
29	24.9	14.9	79	67.7	40.7	29	110.6	66.4	79	153.4	92.2	29	196.3	117.9	79	239.1	143.7
30	25.7	15.5	80	68.6	41.2	30	111.4	67.0	80	154.3	92.7	30	197.1	118.5	80	240.0	144.2
31	26.6	16.0	81	69.4	41.7	131	112.3	67.5	181	155.1	93.2	231	198.0	119.0	281	240.8	144.7
32	27.4	16 5	82	70.3	42.2	32	113.1	68.0	82	156.0	93.7	32	198.8	119.5	82	241.7	145.2
33	28.3	17.0	83	71.1	42.7	33	114.0	68.5	83	156.8	94.2	33	199.7	120.0	83	242.5	145.7
34	29.1	17.5	84	72.0	43.3	34	114.8	69.0	84	157.7	94.8	34	200.5	120.5	84	243.4	146.3
35	30.0	18.0	85	72.8	43.8	35	115.7	69.5	85	158.5	95.3	35	201.4	121.0	85	244.2	146.8
36	30.9	18.5	86	73.7	44.3	136	116.6	70.0	186	159.4	95.8	236	202.3	121.5	286	245.1	147.3
37	31.7	19.1	87	74.6	44.8	37	117.4	70.6	87	160.3	96.3	37	203.1	122.1	87	246.0	147.8
38	32.6	19.6	88	75.4	45.3	38	118.3	71,1	88	161.1	96.8	38	204.0	122.6	88	246.8	148.3
39	33.4	20.1	89	76.3	45.8	39	119.1	71 6	89	162.0	97,3	39	204.8	123,1	89	247.7	148.8
40	34.3	20.6	90	77.1	46.4	40	120.0	72.1	90	162.8	97.9	40	205.7	123.6	90	248.5	149.4
41	35.1	21.1	91	78.0	46.9	141	120.8	72.6	191	163.7	98.4	241	206.5	124.1	291	249.4	149.9
42	36.0	21.6	92	78.8	47.4	42	121.7	73.1	92	164.5	98.9	42	207.4	124.6	92	250.2	150.4
43	36.9	22.1	93	79.7	47.9	43	122.6	73.6	93	165.4	99.4	43	208.3	125.1	93	251.1	150.9
44	37.7	22.6	94	80.6	48.4	44	123.4	74.2	94	166.3	99.9	44	209.1	125.6	94	252.0	151.4
45	38.6	23.2	95	81.4	48.9	45	124,3	74.7	95	167.1	100.4	45	210.0	126.2	95	252.8	151.9
46	39.4	23.7	96	82.3	49.4	146	125.1	75.2	196	168.0	100.9	246	210.8	126.7	296	253.7	152.4
47	40.3	24.2	97	83.1	50.0	47	126.0	75.7	97	168.8	101.5	47	211.7	127.2	97	254.5	153.0
48	41.1	24.7	98	84.0	50.5	48	126.8	76.2	98	169.7	102.0	48	212.5	127.7	98	255 4	153.5
49	42.0	25.2	99	84.8	51.0	49	127.7	76.7	99	170.5	102.5	49	213.4	128.2	99	256.2	154.0
50	42.9	25.8	100	85.7	51.5	50	128.6	77.3	200	171.4	103.0	50	214.3	128.8	300	257.1	154.5
Dist	Dep	Lat	D ist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep
1	00,8	00.5	51	43.2	27.0	101	85.6	35.5	151	128.0	80.0	201	170.4	106.5	251	212.8	133.0
2	01.7	01.1	52	44.1	27.6	02	86.5	54.1	52	128.9	80.6	02	171.3	107.1	52	213.7	133.6
3	02.5	01.6	53	44.9	28.1	03	87.3	54.6	53	129.7	81.1	03	172.1	107.6	53	214.5	134.1
4	03.4	02.1	54	45.8	28.6	04	88.2	55.1	54	130.6	81.6	04	173.0	108.1	54	215.4	134.6
5	04.2	02.7	55	46.6	29.2	05	89.0	55.7	55	131.4	82.2	05	173.8	108.7	55	216.2	135.2
6	05.1	03.2	56	47.5	29.7	106	89.9	56.2	156	132.3	82.7	206	174.7	109.2	256	217.1	135.7
7	05.9	03.7	57	48.3	30.2	07	90.7	56.7	57	133.1	83.2	07	175.5	109.7	57	217.9	136.2
8	06.8	04.2	58	49.2	30.7	08	91.6	57.2	58	134.0	83.7	08	176.4	110.2	58	218.8	136.7
9	07.6	04.8	59	50.0	31.3	09	92.4	57.8	59	134.8	84.3	09	177.2	110.8	59	219.6	137.3
10	08,5	05.3	60	50.9	31.8	10	93.3	58.3	60	135.7	84.8	10	178.1	111.3	60	220.5	137.8
11	09.3	05.8	61	51.7	32.3	111	94.1	58.8	161	136.5	85.3	211	178.9	111.8	261	221.3	138.3
12	10.2	06.4	62	52.6	32.9	12	95.0	59.4	62	137.4	85.9	12	179.8	112.4	62	222.2	138.9
13	11.0	06.9	63	53.4	33.4	13	95.8	59.0	63	138.2	86.4	13	180.6	112.9	63	223.0	139.4
14	11.9	07.4	64	54.3	33.9	14	96.7	60.4	64	139.1	86.9	14	181.5	113.4	64	223.9	139.9
15	12.7	08.0	65	55.1	34.5	15	97.5	61.0	65	139.9	87.5	15	182.3	114.0	65	224.7	140.5
16	13.0	08.5	66	56.0	35.0	116	98.4	61.5	166	140.8	88.0	216	183.2	114.5	266	225 6	141.0
17	14.4	09.0	67	56.8	35.5	17	99.2	62.0	67	141.6	88.5	17	184.0	115.0	67	226.4	141.5
18	15.3	09.5	68	57.7	36.0	18	100.1	62.5	68	142.5	89.0	18	184,9	115.5	68	227.3	142.0
19	16.1	10.1	69	58.5	36.6	19	100.9	63.1	69	143 3	89.6	19	185.7	116.1	69	228.1	142.6
20	17.0	10.6	70	59.4	37.1	20	101.8	63.6	70	144.2	90.1	20	186.6	116.6	70	229.0	143.1
21	17.8	11.1	71	60.2	37.6	121	102.6	64.1	171	145.0	90.6	121	187.4	117.1	271	229.8	143.6
22	18.7	11.7	72	61.1	38.2	22	103.5	64.7	72	145.9	91.2	22	188.3	117.7	72	230.7	144.2
23	19.5	12.2	73	61.9	38.7	23	104.3	65.2	73	146.7	91.7	23	189.1	118.2	73	231.5	144.7
24	20.4	12.7	74	62.8	39.2	24	105.2	65 7	74	147.6	92.2	24	190.0	118.7	74	232.4	145.2
25	21.2	13.3	75	63.6	39.8	25	106.0	66 3	75	148.4	92.8	25	190.8	119.3	75	233.2	145.8
26	22.0	13.8	76	64.4	40.3	126	106.8	66.8	176	149.2	93.3	226	191.6	119.8	276	234.0	146.3
27	22.9	14.3	77	65.3	40.8	27	107.7	67.3	77	150.1	93.8	27	192.5	120.3	77	234.9	146.8
28	23.7	14.8	78	66.1	41.3	28	108.5	67.8	78	150.9	94.3	28	193.3	120.8	78	235.7	147.3
29	24.6	15.4	79	67.0	41.9	29	109.4	68.4	79	151.8	94.9	29	194.2	121.4	79	236.6	147.9
30	25.4	15.9	80	67.8	42.4	30	110.2	68.9	80	152.6	95 4	30	195.0	121.9	80	237.4	148.4
31	26.3	16.4	81	68.7	42.9	131	111.1	69.4	181	153.5	95.9	231	195.9	122.4	281	238.3	148.9
32	27.1	17.0	82	69.5	43.5	32	111.9	70.0	82	154.3	96.5	32	196.7	123.0	82	239.1	149.5
33	28.0	17.5	83	70.4	44.0	33	112.8	70.5	83	155.2	97.0	33	197.6	123.5	83	240 0	150.0
34	28.8	18.0	84	71.2	44.5	34	113.6	71.0	84	156.0	97.5	34	198.4	124.0	84	240.8	150.5
35	29.7	18.6	85	72.1	45.1	35	114.5	71.6	85	156.9	98.1	35	199.3	124.6	85	241.7	151.1
36	30.5	19.1	86	72.9	45.6	136	115.3	72.1	186	157.7	98.6	236	200.1	125.1	286	242.5	151.6
37	31.4	19.6	87	73.8	46.1	37	116.2	72.6	87	158.6	99.1	37	201.0	125.6	87	243.4	152.1
38	32.2	20.1	88	74.6	46.6	38	117.0	73.1	88	159.4	99.6	38	201.8	126.1	88	244.2	152.6
39	33.1	20.7	89	75.5	47.2	39	117.9	73.7	89	160.3	100.2	39	202.7	126.7	89	245.1	153.2
40	33.9	21.2	90	76.3	47.7	40	118.7	74.2	90	161.1	100.7	40	203.5	127.2	90	245.9	153.7
41	34.8	21.7	91	77.2	48.2	141	119.6	74,7	191	162.0	101.2	241	204.4	127.7	291	246.8	154.2
42	35.6	22.3	92	78.0	48.8	42	120.4	75.3	92	162.8	101.8	42	205.2	128.3	92	247.6	154.8
43	36.5	22.8	93	78.9	49.3	43	121.3	75.8	93	163.7	102.3	43	206,1	128,8	93	248.5	155.3
44	37.3	23.3	94	79.7	49.8	44	122.1	76.3	94	164.5	102.8	44	206.9	129.3	94	249.3	155.8
45	38.2	23.9	95	80.6	50.4	45	123.0	76.9	95	165.4	103.4	45	207.8	129.9	95	250.2	156.4
46	39,0	24.4	96	81.4	50.9	146	123.8	77.4	196	166.2	103.9	246	208.6	130.4	296	251.0	156.9
47	39.9	24.9	97	82.3	51.4	47	124.7	77.9	97	167.1	104.4	47	209.5	130.9	97	251.9	157.4
48	40.7	25.4	98	83.1	51.9	48	125.5	78.4	98	167.9	104.9	48	210.3	131.4	98	252.7	157.9
49	41.6	26.0	99	84.0	52.5	49	126.4	79,0	99	168.8	105.5	49	211.1	132.0	99	253.6	158.5
50	42.4	26.5	100	84.8	53.0	150	127.2	79.5	200	169.6	106.0	250	212.0	132.5	300	254.4	159.0
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	La	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.8	00.5	51	42.8	27.8	101	84.7	55.0	151	126.2	82.2	201	168.6	109.5	251	210.5	136.7
2	01.7	01.1	52	43.6	28.3	02	85.5	55.5	52	127.5	82.8	02	169.4	110.0	52	211.3	137.2
3	02.5	01.6	53	44	28.9	03	86.4	56.1	53	128.3	83.3	03	170.2	110.6	53	212.2	137.8
4	03.4	02.2	54	45.3	29.4	04	87.2	56.6	54	129.1	83.9	04	171.1	111.1	54	213.0	138.3
5	04.2	02.7	55	46.1	30.0	05	88.1	57.2	55	130.0	84.4	05	171.9	111.6	55	213.8	138.9
6	05.0	03.3	56	47.0	30.5	106	88,9	57.7	156	130.8	85.0	206	172.8	112.2	256	214.7	139.4
7	05.9	03.8	57	47.8	31.0	07	89.7	58,3	57	131.7	85.5	07	173.6	112.7	57	215.5	140.0
8	06.7	04.4	58	48.6	31.6	08	90.6	58.8	58	132.5	86.0	08	174.4	113.3	58	216.4	140.5
9	07.5	04.9	59	49.5	32.1	09	91.4	59.4	59	133.3	86.6	09	175.3	113,8	59	217.2	141.1
10	08.4	05.4	60	50.3	32.7	10	92.2	59.9	60	134.2	87.1	10	176.1	114.4	60	218.0	141.6
11	09.0	06.0	61	51.2	33.2	111	93.1	60.5	161	135.0	87.7	211	176.9	114.9	261	218.9	142 1
12	10.1	06.5	62	52.0	33.8	12	93.9	61.0	62	135.9	88.2	12	177.8	115.5	62	219.7	142.7
13	10.9	07.1	63	52.8	34.3	13	94 8	61.5	63	136.7	88.8	13	178.6	116.0	63	220.6	143.2
14	11.7	07.6	64	53.7	34.9	14	95,6	62.1	64	137.5	89.3	14	179.5	116.5	64	221.4	143.8
15	12.6	08.2	65	54.5	35.4	15	96.4	62.6	65	138.4	89.9	15	180.3	117.1	65	222.2	144.3
16	13.4	08.7	66	55.3	35.9	116	97.3	63.2	166	139.2	90.4	216	181.1	117.6	266	223.1	144.9
17	14.3	09.3	67	56.2	36.5	17	98.1	63.7	67	140.0	90.9	17	182.0	118.2	67	223.9	145.4
18	15.1	09.8	68	57.0	37.0	18	99.0	64.3	68	140.9	91.5	18	182.8	118.7	68	224.7	146.0
19	15.9	10.3	69	57.9	37.6	19	99,8	64.8	69	141.7	92.0	19	183.7	119.3	69	225.6	146.5
20	16.8	10.9	70	58.7	38.1	20	100.6	65.4	70	142 6	92.6	20	184.5	119.8	70	226.4	147.0
21	17.6	11.4	71	59.5	38.7	121	101.5	65.9	171	143.4	93.1	221	185.3	120.4	271	227.3	147.6
22	18.4	12.0	72	60.4	39.2	22	102.3	66.4	72	144.2	93.7	22	186.2	120.9	72	228.1	148.1
23	19.3	12.5	73	61,2	39.8	23	103.1	67.0	73	145.1	94.2	23	187.0	121.4	73	228.9	148.7
24	20.1	13.1	74	62.1	40.3	24	104.0	67.5	74	145.9	94.8	24	187.8	122.0	74	229.8	149.2
25	21.0	13.6	75	62.9	40.8	25	104.8	68.1	75	146.8	95.3	25	188.7	122.5	75	230.6	149.8
26	21.8	14.2	76	63.7	41.4	126	105.7	68.6	176	147.6	95.8	226	189.5	123,1	276	231.5	150.3
27	22.6	14.7	77	64.6	41.9	27	106.5	69.2	77	148.4	96.4	27	190.4	123.6	77	232.3	150.9
28	23 5	15.2	78	65.4	42.5	28	107.3	69.7	78	149.3	96.9	28	191.2	124.2	78	233.1	151.4
29	24.3	15.8	79	66.2	43.0	29	108.2	70.3	79	150.1	97,5	29	192.0	124.7	79	234.0	151.9
30	25.2	16.3	80	67.1	43.6	30	109.0	70.8	80	150.9	98.0	30	192.9	125.3	80	234.8	152.5
31	26.0	16 9	81	67.9	44.1	131	109.9	71,3	181	151.8	98.6	231	193.7	125.8	281	235.6	153.0
32	26.8	17.4	82	68.8	44.7	32	110.7	71 9	82	152.6	99.1	32	194.6	126.3	82	236.5	153.6
33	27 7	18.0	83	69.6	45.2	33	111.5	72.4	83	153.5	99.7	33	195.4	126.9	83	237.3	154.1
34	28.5	18.5	84	70.4	45.7	34	112.4	73.0	84	154.3	100.2	34	196.2	127.4	84	238.2	154.7
35	29.4	19.1	85	71.3	46.3	35	113.2	73.5	85	155.1	100.8	35	197.1	128.0	85	239.0	155.2
36	30.2	19.6	86	72.1	46.8	136	114.0	74.1	186	156.0	101.3	236	197.9	128.5	286	239.8	155.8
37	31.0	20.2	87	73.0	47.4	37	114.9	74.6	87	156.8	101.8	37	198.7	129.1	87	240.7	156.3
38	31.9	20.7	88	73.8	47.9	38	115.7	75.2	88	157.7	102.4	38	199.6	129,6	88	241 5	156.8
39	32.7	21.2	89	74.6	48.5	39	116.6	75.7	89	158.5	102.9	39	200.4	130.2	89	242.4	157.4
40	33.5	21.8	90	75.5	49.0	40	117.4	76.2	90	159.3	103.5	40	201.3	130.7	90	243.2	157.9
41	34.4	22.3	91	76.3	49,6	141	118.2	76.8	191	160.2	104.0	241	202.1	131.2	291	244.0	158.5
42	35.2	22.9	92	77.2	50.1	42	119.1	77.3	92	161.0	104.6	42	202.9	131.8	92	244.9	159.0
43	36.1	23.4	93	78.0	50.6	43	119.9	77.9	93	161.8	105,1	43	203.8	132.3	93	245.7	159.6
44	36.9	24.0	94	78.8	51.2	44	120.8	78.4	94	162.7	105.7	44	204.6	132.9	94	246.5	160.1
45	37.7	24.5	95	79.7	51.7	45	121.6	79.0	95	163.5	106.2	45	205.5	133.4	95	247.4	160.7
46	38.6	25.1	96	80.5	52.3	146	122.4	79.5	196	164.4	106.7	246	206.3	134.0	296	248.2	161.2
47	39.4	25.6	97	81.3	52.8	47	123.3	80.1	97	165.2	107.3	47	207.1	134.5	97	249.1	161.7
48	40.3	26.1	98	82.2	53.4	48	124.1	80.6	98	166.0	107.8	48	208.0	135.1	98	249.9	162.3
49	41.1	26.7	99	83.0	53.9	49	125.0	81.1	99	166.9	108.4	49	208.8	135.6	99	250.7	162.8
50	41.9	27.2	100	83.9	54 5	50	125.8	81.7	200	167.7	108.9	50	209.7	136.2	300	251.6	163.4
Dist	Dep	Lat	D ft	Dep	Lat	D ft	Dep	Lat.	Dist	Dep	Lat	D ft	Dep	Lat	Dist	Dep	Lat

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep
1	00,8	00.6	51	42.3	28.5	101	83.7	56.5	151	125.2	84.4	201	166.6	112.4	251	208.1	140.4
2	01.7	01.1	52	43.1	29.1	02	84.6	57.0	52	126.0	85.0	02	167.5	113.0	52	208.9	140.9
3	02.5	01.7	53	43.9	29.6	03	85.4	57.6	53	126.8	85.6	03	168.3	113.5	53	209.7	141.5
4	03.3	02.2	54	44.8	30.2	04	86.2	58.2	54	127.7	86.1	04	169.1	114.1	54	210.6	142.0
5	04.1	02.8	55	45.6	30.8	05	87.0	58.7	55	128.5	86.7	05	169.9	114.6	55	211.4	142.6
6	05.0	03.4	56	46.4	31.3	106	87.9	59.3	156	129.3	87.2	206	170.8	115.2	256	212.2	143.2
7	05.8	03.9	57	47.3	31.9	07	88.7	59.8	57	130.2	87.8	07	171.6	115.8	57	213.1	143.7
8	06.6	04.5	58	48.1	32.4	08	89.5	60.4	58	131.0	88.4	08	172.4	116.3	58	213.9	144.3
9	07.5	05.0	59	48.9	33.0	09	90.4	61.0	59	131.8	88.9	09	173.3	116.9	59	214.7	144.8
10	08,3	05.6	60	49.7	33.6	10	91.2	61.5	60	132.6	89.5	10	174.1	117.4	60	215.5	145.4
11	09.1	06.2	61	50.6	34.1	111	92.0	62.1	161	133.5	90.0	211	174.9	118.0	261	216.4	146.0
12	09.9	06.7	62	51.4	34.7	12	92.8	62.6	62	134.3	90.6	12	175.7	118.6	62	217.2	146.5
13	10.8	07.3	63	52.2	35.2	13	93.7	63.2	63	135.1	91.1	13	176.6	119.1	63	218.0	147.1
14	11.6	07.8	64	53.1	35.8	14	94.5	63.7	64	136.0	91.7	14	177.4	119.7	64	218.9	147.6
15	12.4	08.4	65	53.9	36.3	15	95.3	64.3	65	136.8	92.3	15	178.2	120.2	65	219.7	148.2
16	13.3	08.9	66	54.7	36.9	116	96.2	64.9	166	137.6	92.8	216	179.1	120.8	266	220.5	148.7
17	14.1	09.5	67	55.5	37.5	17	97.0	65.4	67	138.4	93.4	17	179.9	121.3	67	221.3	149.3
18	14.9	10.1	68	56.4	38.0	18	97.8	65.0	68	139.3	93.9	18	180.7	121.9	68	222.2	149.9
19	15.8	10.6	69	57.2	38.6	19	98.7	66.5	69	140.1	94.5	19	181.6	122.5	69	223.0	150.4
20	16.6	11.2	70	58.0	39.1	20	99.5	67.1	70	140.9	95.1	20	182.4	123.0	70	223.8	151.0
21	17.4	11.7	71	58.9	39.7	121	100.3	67.7	171	141.8	95.6	121	183.2	123.6	271	224.7	151.5
22	18.2	12.3	72	59.7	40.3	22	101.1	68.2	72	142.6	96.2	22	184.0	124.1	72	225.5	152.1
23	19.1	12.9	73	60.5	40.8	23	102.0	68.8	73	143 4	96.7	23	184.9	124.7	73	226.3	152.7
24	19.9	13.4	74	61.3	41.4	24	102.8	69.3	74	144.2	97.3	24	185.7	125.3	74	227.1	153.2
25	20.7	14.0	75	62.2	41.9	25	103.6	69.9	75	145.1	97.9	25	186.5	125.8	75	228.0	153.8
26	21.6	14.5	76	63.0	42.5	126	104.5	70.5	176	145.9	98.4	226	187.4	126.4	276	228.8	154.3
27	22.4	15.1	77	63.8	43.1	27	105.3	71.0	77	146.7	99.0	27	188.2	126.9	77	229.6	154.9
28	23.2	15.7	78	64.7	43.6	28	106.1	71.6	78	147.6	99.5	28	189.0	127.5	78	230.5	155.5
29	24.0	16.2	79	65.5	44.2	29	106.9	72.1	79	148.4	100.1	29	189.8	128.1	79	231.3	156.0
30	24,9	16.8	80	66.3	44.7	30	107.8	72.7	80	149.2	100.7	30	190.7	128,6	80	232.1	156.6
31	25.7	17.3	81	67.1	45.3	131	108.6	73.3	181	150.0	101.2	231	191.5	129.2	281	232.9	157.1
32	26.5	17.9	82	68.0	45.9	32	109.4	73.8	82	150.9	101.8	32	192.3	129.7	82	233.8	157.7
33	27.4	18.5	83	68.8	46.4	33	110.3	74.4	83	151.7	102.3	33	193.2	130.3	83	234.6	158.3
34	28.2	19.0	84	69.6	47.0	34	111.1	74,9	84	152.5	102.9	34	194.0	130.9	84	235.4	158.8
35	29.0	19.6	85	70.5	47.5	35	111.9	75.5	85	153.4	103.5	35	194.8	131.4	85	236.3	159.4
36	29.8	20.1	86	71.3	48.1	136	112.7	76.1	186	154.2	104.0	236	195.6	132.0	286	237.1	159.9
37	30.7	20.7	87	72.1	48.7	37	113.6	76.6	87	155.0	104.6	37	196.5	132.5	87	237.9	160.5
38	31.5	21.2	88	73.0	49.2	38	114.4	77.2	88	155.9	105.1	38	197.3	133.1	88	238.8	161.0
39	32.3	21.8	89	73.8	49.8	39	115.2	77.7	89	156.7	105.7	39	198.1	133.6	89	239 6	161.6
40	33.2	22.4	90	74.6	50.3	40	116.1	78.3	90	157.5	106.2	40	199.0	134.2	90	240.4	162.2
41	34.0	22.9	91	75.4	50.9	141	116.9	78.8	191	158.3	106.8	241	199.8	134.8	291	241.2	162.7
42	34.8	23.5	92	76.3	51.4	42	117.7	79,4	92	159.2	107.4	42	200.6	135.3	92	242.1	163.5
43	55.6	24.0	93	77.1	52.0	43	118.5	80.0	93	160.0	107.9	43	201.4	135.9	93	242.9	163.8
44	36.5	24.6	94	77.9	52.6	44	119.4	80.5	94	160.8	108.5	44	202.3	136.4	94	243.7	164.4
45	37.3	25.2	95	78.8	53.1	45	120.2	81.1	95	161.7	109.0	45	203.1	137.0	95	244.6	165.0
46	38.1	25.7	96	79.6	53.7	146	121.0	81.6	196	162.5	109.6	246	203.9	137.6	296	245.4	165.5
47	39,0	26.3	97	80.4	54.2	47	121.9	82.2	97	163.3	110.2	47	204.8	138.1	97	246.2	166.1
48	39.8	26.8	98	81.2	54.8	48	122.7	82.8	98	164.1	110.7	48	205.6	138.7	98	247.0	166.6
49	40.6	27.4	99	82.1	55.4	49	123.5	83.3	99	165.0	111.3	49	206,4	139.2	99	247.9	167.2
50	41.5	28.0	100	82.9	55.9	150	124.4	83.9	200	165.8	111.8	250	207.3	139.8	300	248.7	167.8
Dist	Dep	Lat	Dist	Dep	Lat	Dist		Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	51	41.8	29.2	101	82.7	57.9	151	123.7	86.6	201	164.6	115.3	251	205.6	143.9			
2	01.6	01.1	52	42.6	29.8	02	83.5	58.5	52	124.5	87.2	02	165.4	115.8	52	206.4	144.5			
3	02.5	01.7	53	43.4	30.4	03	84.4	59.1	53	125.3	87.7	03	166.3	116.4	53	207.2	145.1			
4	03.3	02.3	54	44.2	31.0	04	85.2	59.6	54	126.1	88.3	04	167.1	117.0	54	208.0	145.7			
5	04.1	02.9	55	45.0	31.5	05	86.0	60.2	55	126.9	88.9	05	167.9	117.6	55	208.8	146.2			
6	04.9	03.4	56	45.9	32.1	106	86,8	60.8	156	127.8	89.5	206	168.7	118.1	256	209.6	146.8			
7	05.7	04.0	57	46.7	32.7	07	87.6	61.4	57	128.6	90.0	07	169.5	118.7	57	210.5	147.4			
8	06.6	04.6	58	47.5	33.3	08	88.5	61.9	58	129.4	90.6	08	170.3	119.3	58	211.3	148.0			
9	07.4	05.2	59	48.3	33.8	09	89.3	62.5	59	130.2	91.2	09	171.2	119.9	59	212.1	148.5			
10	08.2	05.7	60	49.1	34.4	10	90.1	63.1	60	131.0	91.8	10	172.0	120.4	60	212.9	149.1			
11	09.0	06.3	61	50.0	35.0	111	90.9	63.7	161	131.9	92.3	211	172.8	121.0	261	213.8	149.7			
12	09.8	06.9	62	50.8	35.6	12	91.7	64.2	62	132.7	92.9	12	173.6	121.6	62	214.6	150.3			
13	10.6	07.5	63	51.6	36.1	13	92.5	64.8	63	133.5	93.5	13	174.4	122.2	63	215.4	150.8			
14	11.5	08.0	64	52.4	36.7	14	93.4	65.4	64	134.3	94.1	14	175.3	122.7	64	216.2	151.4			
15	12.3	08.6	65	53.2	37.3	15	94.2	66.0	65	135.1	94.6	15	176.1	123.3	65	217.0	152.0			
16	13.1	09.2	66	54.1	37.0	116	95.0	66.5	166	136.0	95.2	216	176.9	123.9	266	217.8	152.6			
17	13.9	09.7	67	54.9	38.4	17	95,8	67.1	67	136.8	95.8	17	177.7	124.4	67	218.7	153.1			
18	14.7	10.3	68	55.7	39.0	18	96.6	67.7	68	137.6	96.3	18	178.5	125.0	68	219.5	153.7			
19	15.6	10.9	69	56.5	39.6	19	97.5	68.2	69	138.4	96.9	19	179.4	125.6	69	220.3	154.3			
20	16.4	11.5	70	57.3	40.1	20	98.3	68.8	70	139.2	97.5	20	180.2	126.2	70	221.1	154.8			
21	17.2	12.0	71	58.1	40,7	121	99.1	69.4	171	140.0	98.1	221	181.0	126.7	271	221.9	155.4			
22	18.0	12.6	72	59.0	41.3	22	99,9	70.0	72	140.9	98.6	22	181.8	127.3	72	222.8	156.0			
23	18.8	13.2	73	59.8	41.9	23	100.7	70.5	73	141.7	99.2	23	182.6	127.9	73	223.6	156.6			
24	19.6	13.8	74	60.6	42.4	24	101.6	71,1	74	142.5	99.8	24	183.5	128.5	74	224.4	157.1			
25	20.5	14.3	75	61,4	43.0	25	102.4	71 7	75	143.3	100.4	25	184.3	129.0	75	225.2	157.7			
26	21.3	14.9	76	62.2	43.6	126	103.2	72.3	176	144.1	100.9	226	185.1	129,6	276	226.0	158.3			
27	22.1	15.5	77	63.1	44.2	27	104.0	72.8	77	145.0	101.5	27	185.9	130.2	77	226.9	158.9			
28	22.9	16.1	78	63.9	44.7	28	104.8	73.4	78	145.8	102.1	28	186.7	130.8	78	227.7	159.4			
29	23.8	16.6	79	64.7	45.3	29	105.6	74.0	79	146.6	102.7	29	187.5	131.3	79	228.5	160.0			
30	24.6	17.2	80	65.5	45.9	30	106.5	74.6	80	147.4	103.2	30	188.4	131.9	80	229.3	160.6			
31	25.4	17.8	81	66.3	46.5	131	107.3	75.1	181	148.2	103.8	231	189.2	132.5	281	230.1	161.2			
32	26.2	18.4	82	67.2	47.0	32	108.1	75.7	82	149.1	104.4	32	190.0	133.1	82	231.0	161.7			
33	27.0	18.9	83	68.0	47.6	33	108.9	76.3	83	149.9	105,0	33	190.8	133.6	83	231.8	162.3			
34	27 8	19.5	84	68.8	48.2	34	109.7	76.8	84	150.7	105.5	34	191.6	134.2	84	232.6	162.9			
35	28.7	20.1	85	69.6	48.7	35	110.6	77.4	85	151.5	106.1	35	192.5	134.8	85	233.4	163.4			
36	29.5	20.6	86	70.4	49.3	136	111.4	78.0	186	152.3	106.7	236	193.3	135.3	286	234.2	164.0			
37	30.3	21.2	87	71.3	49,9	37	112.2	78.6	87	153.1	107.2	37	194.1	135.9	87	235.0	164.6			
38	31.1	21.8	88	72.1	50.5	38	113.0	79.1	88	154.0	107.8	38	194.9	136.5	88	235.9	165.2			
39	31.9	22.4	89	72.9	51.0	39	113.8	79.7	89	154.8	108.4	39	195.7	137.1	89	236.7	165.7			
40	32.8	22.9	90	73.7	51.6	40	114.6	80.3	90	155.6	109.0	40	196.6	137.6	90	237.5	166.3			
41	33.6	23.5	91	74.5	52.2	141	115.5	80.9	191	156.4	109.5	241	197.4	138,2	291	238.3	166.9			
42	34.4	24.1	92	75.3	52.8	42	116.3	81.4	92	157.2	110.1	42	198.2	138.8	92	239.1	167.5			
43	35.2	24.7	93	76.2	53.3	43	117.1	82.0	93	158.1	110.7	43	199.0	139.4	93	240.0	168.0			
44	36.0	25.2	94	77.0	53.9	44	117.9	82.6	94	158.9	111.3	44	199.8	139.9	94	240.8	168.6			
45	36.9	25.8	95	77.8	54 5	45	118.8	83.2	95	159.7	111.8	45	200.6	140.5	95	241.6	169.2			
46	37.7	26.8	96	78.6	55.1	146	119.6	83.7	196	160.5	112.4	246	201.5	141.1	296	242.4	169.8			
47	38.5	27.0	97	79.4	55.6	47	120.4	84.3	97	161.3	113.0	47	202.3	141.7	97	243.2	170.3			
48	39.3	27.5	98	80.3	56.2	48	121.2	84.9	98	162.2	113.6	48	203.1	142.2	98	244.1	170.9			
49	40.1	28.1	99	81.1	56.8	49	122.0	85.5	99	163.0	114.1	49	203.9	142.8	99	244.9	171.5			
50	41.0	28.7	100	81.9	57.4	50	122.8	86.0	200	163.8	114.7	50	204.7	143.4	300	245.7	172.1			
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat	D st	Dep	Lat	Dist	Dep	Lat			

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00,8	00.6	51	41.3	30.0	101	81.7	59.4	151	122.2	88.8	201	162.6	118.1	251	203.1	147.5
2	01.6	01.2	52	42.1	30.6	02	82.5	60.0	52	123.0	89.3	02	163.4	118.7	52	203.9	148.1
3	02.4	01.8	53	42.9	31.2	03	83.3	60.5	53	123.8	89.9	03	164.2	119.3	53	204.7	148.7
4	03.2	02.4	54	43.7	31.7	04	84.1	61.1	54	124.6	90.5	04	165.0	119.9	54	205.5	149.3
5	04.0	02.9	55	44.5	32.3	05	84.9	61.7	55	125.4	91.1	05	165.8	120.5	55	206,3	149.9
6	04.9	03.5	56	45.3	32.9	106	85.8	62.3	156	126.2	91.7	206	166.7	121.1	256	207.1	150.5
7	05.7	04.1	57	46.1	33.5	07	86.6	62.9	57	127.0	92.3	07	167.5	121.7	57	207.9	151.1
8	06.5	04.7	58	46.9	34.1	08	87.4	63.5	58	127.8	92.9	08	168.3	122.3	58	208.7	151.7
9	07.3	05.3	59	47.7	34.7	09	88.2	64.1	59	128.6	93.5	09	169.1	122.8	59	209.5	152.2
10	08,1	05.9	60	48.5	35.3	10	89.0	64.7	60	129.4	94.0	10	169.9	123.4	60	210.3	152.8
11	08.9	06.5	61	49.3	35.9	111	89.8	65.2	161	130.2	94.6	211	170.7	124.0	261	211.1	153.4
12	09.7	07.1	62	50.2	36.4	12	90.6	65.8	62	131.1	95.2	12	171.5	124.6	62	212.0	154.0
13	10.5	07.6	63	51.0	37.0	13	91.4	66 4	63	131.9	95.8	13	172.3	125.2	63	212,8	154.6
14	11.3	08.2	64	51.8	37.6	14	92.2	67.0	64	132.7	96.4	14	173.1	125.8	64	213.6	155.2
15	12.1	08.8	65	52.6	38.2	15	93.0	67.6	65	133.5	97.0	15	173.9	126.4	65	214.4	155.8
16	12.9	09.4	66	53.4	38.8	116	93.8	68.2	166	134.3	97 6	216	174.7	127.0	266	215.2	156.4
17	13.8	10.0	67	54.2	39.4	17	94.7	68.8	67	135.1	98.2	17	175.6	127.6	67	216.0	156.9
18	14.6	10.6	68	55.0	40.0	18	95.5	69.4	68	135.9	98.7	18	176.4	128.1	68	216.8	157.5
19	15.4	11.2	69	55.8	40.6	19	96.3	69.9	69	136.7	99.3	19	177.2	128,7	69	217.6	158.1
20	16.2	11.8	70	56.6	41.1	20	97.1	70.5	70	137.5	99.9	20	178.0	129.3	70	218.4	158.7
21	17.0	12.3	71	57.4	41.7	121	97.9	71.1	171	138.3	100.5	121	178.8	129.9	271	219.2	159.3
22	17.8	12.9	72	58.2	42.3	22	98.7	71.7	72	139.1	101.1	22	179.6	130.5	72	220.0	159.9
23	18.7	13.5	73	59.1	42.9	23	99.5	72.3	73	140.0	101.7	23	180.4	131.1	73	220.9	160.5
24	19.4	14.1	74	59.9	43.5	24	100.3	72.9	74	140.8	102.3	24	181.2	131.7	74	221.7	161.1
25	20.2	14.7	75	60.7	44.1	25	101.1	73.5	75	141.6	102 9	25	182.0	132.3	75	222.5	161.6
26	21.0	15.3	76	61.5	44.7	126	101.9	74.1	176	142.4	103.5	226	182.8	132.8	276	223.3	162.2
27	21.8	15.9	77	62.3	45.3	27	102.7	74,7	77	143 2	104.0	27	183.6	133.4	77	224.1	162.8
28	22.7	16.5	78	63.1	45.8	28	103.6	75.2	78	144.0	104.6	28	184.5	134.0	78	224.9	163.4
29	23.5	17.0	79	63.9	46.4	29	104.4	75.8	79	144.8	105.2	29	185.3	134.6	79	225.7	164.0
30	24.3	17.6	80	64.7	47.0	30	105.2	76.4	80	145.6	105.8	30	186.1	135.2	80	226.5	164.6
31	25,1	18.2	81	65.5	47.6	131	106.0	77.0	181	146.4	106.4	231	186.9	135.8	281	227.3	165.2
32	25.9	18.8	82	66.3	48.2	32	106.8	77.6	82	147.2	107.0	32	187.7	136.4	82	228.1	165.8
33	26.7	19.4	83	67.1	48.8	33	107.6	78.2	83	148.0	107.6	33	188.5	137.0	83	228.9	166.3
34	27.5	20.0	84	68.0	49.4	34	108.4	78.8	84	148.9	108.2	34	189.3	137.5	84	229.8	166.9
35	28.3	20.6	85	68.8	50.0	35	109.2	79,4	85	149.7	108.7	35	190.1	138.1	85	230.6	167.5
36	29.1	21.2	86	69.6	50 6	136	110.0	79.9	186	150.5	109.3	236	190.9	138.7	286	231.4	168.1
37	29.9	21.7	87	70.4	51.1	37	110.8	80.5	87	151.3	109.9	37	191.7	139.3	87	232.2	168.7
38	30.7	22.3	88	71.2	51.7	38	111.6	81.1	88	152.1	110.5	38	192.5	139.9	88	233.0	169.3
39	31.6	22.9	89	72.0	52.3	39	112.5	81.7	89	152.9	111.1	39	193.3	140.5	89	233.8	169.9
40	32.4	23.5	90	72.8	52.9	40	113.3	82.3	90	153.7	111.7	40	194.2	141.1	90	234.6	170.5
41	33.2	24.1	91	73.6	53.5	141	114.1	82.9	191	154.5	112.3	241	195.0	141.7	291	235.4	171.0
42	34.0	24.7	92	74.4	54.1	42	114.9	83.5	92	155.3	112.9	42	195.8	142.2	92	236.2	171.6
43	34.8	25.3	93	75.2	54.7	43	115.7	84.1	93	156.1	113.4	43	196.6	142.8	93	237.0	172.2
44	55.6	25.9	94	76.0	55.3	44	116.5	84.6	94	156.9	114.0	44	197.4	143.4	94	237.8	172.8
45	36.4	26.5	95	76.9	55.8	45	117.3	85.2	95	157.8	114.6	45	198.2	144.0	95	238.7	173.4
46	37.2	27.0	96	77.7	56.4	146	118.1	85.8	196	158.6	115.2	246	199.0	144.6	296	239 5	174.0
47	38.0	27.6	97	78.5	57.0	47	118.9	86.4	97	159.4	115.8	47	199.8	145.2	97	240.3	174.6
48	38.8	28.2	98	79.3	57.6	48	119.7	87.0	98	160.2	116.4	48	200.6	145.8	98	241.1	175.2
49	39,6	28.8	99	80.1	58.2	49	120.5	87.6	99	161.0	117.0	49	201.4	146.4	99	241.9	175.7
50	40.5	29.4	100	80.9	58.8	150	121.3	88.2	200	161.8	117.6	250	202.2	146.9	300	242.7	176.3
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.8	00.6	51	40.7	30.7	101	80.7	60.8	151	120.6	90.9	201	160.5	121.0	251	200.4	151.0
2	01.6	01.2	52	41.5	31.3	02	81.5	61.4	52	121.4	91.5	02	161.3	121.6	52	201.2	151.6
3	02.4	01.8	53	42.3	31.9	03	82.3	62.0	53	122.2	92.1	03	162.1	122.2	53	202.0	152.2
4	03.2	02.4	54	43.1	32.5	04	83.1	62.6	54	123.0	92.7	04	162.9	122.8	54	202.8	152.9
5	04.0	03.0	55	43.9	33.1	05	83.9	63.2	55	123.8	93.3	05	163.7	123.4	55	203.6	153.5
6	04.8	03.6	56	44.7	33.7	106	84.7	63.8	156	124.6	93.9	206	164.5	124.0	256	204.4	154.1
7	05.6	04.2	57	45.5	34.3	07	85.5	64.4	57	125.4	94.5	07	165.3	124.6	57	205.2	154.7
8	06.4	04.8	58	46.3	34.9	08	86.2	65.0	58	126.2	95.1	08	166.1	125.2	58	206.0	155.3
9	07.2	05.4	59	47.1	35.5	09	87.0	65.6	59	127.0	95.7	09	166.9	125.8	59	206.8	155.9
10	08.0	06.0	60	47.9	36.1	10	87.8	66.2	60	127.8	96.3	10	167.7	126.4	60	207.6	156.5
11	08.8	06.6	61	48.7	36.7	111	88.6	66.8	161	128.6	96.9	211	168.5	127.0	261	208.4	157.1
12	09.6	07.2	62	49.5	37.3	12	89.4	67.4	62	129.4	97.5	12	169.3	127.6	62	209.2	157.7
13	10.4	07.8	63	50.3	37.9	13	90.2	68.0	63	130.2	98.1	13	170.1	128.2	63	210.0	158.3
14	11.2	08.4	64	51.1	38.5	14	91.0	68.6	64	131.0	98.7	14	170.9	128.8	64	210.8	158.9
15	12.0	09.0	65	51.9	39.1	15	91.8	69.2	65	131.8	99.3	15	171.7	129.4	65	211.6	159.5
16	12.8	09.6	66	52.7	39.7	116	92.6	69.8	166	132.6	99.9	216	172.5	130.0	266	212.4	160.1
17	13.6	10.2	67	53.5	40.3	17	93.4	70.4	67	133.4	100.5	17	173.3	130.6	67	213.2	160.7
18	14.4	10.8	68	54.3	40.9	18	94.2	71.0	68	134.2	101.1	18	174.1	131.2	68	214.0	161.3
19	15.2	11.4	69	55.1	41.5	19	95.0	71.6	69	135.0	101.7	19	174.9	131.8	69	214.8	161.9
20	16.0	12.0	70	55.9	42.1	20	95.8	72.2	70	135.8	102.3	20	175.7	132.4	70	215.6	162.5
21	16.8	12.6	71	56.7	42.7	121	96.6	72.8	171	136.6	102.9	221	176.5	133.0	271	216.4	163.1
22	17.6	13.2	72	57.5	43.3	22	97.4	73.4	72	137.4	103.5	22	177.3	133.6	72	217.2	163.7
23	18.4	13.8	73	58.3	43.9	23	98.2	74.0	73	138.2	104.1	23	178.1	134.2	73	218.0	164.3
24	19.2	14.4	74	59.1	44.5	24	99.0	74.6	74	139.0	104.7	24	178.9	134.8	74	218.8	164.9
25	20.0	15.0	75	59.9	45.1	25	99.8	75.2	75	139.8	105.3	25	179.7	135.4	75	219.6	165.5
26	20.8	15.6	76	60.7	45.7	126	100.6	75.8	176	140.6	105.7	226	180.5	136.0	276	220.4	166.1
27	21.6	16.2	77	61.5	46.3	27	101.4	76.4	77	141.4	106.5	27	181.3	136.6	77	221.2	166.7
28	22.4	16.9	78	62.3	46.9	28	102.2	77.0	78	142.2	107.1	28	182.1	137.2	78	222.0	167.3
29	23.2	17.5	79	63.1	47.5	29	103.0	77.6	79	142.9	107.7	29	182.9	137.8	79	222.8	167.9
30	24.0	18.1	80	63.9	48.1	30	103.8	78.2	80	143.7	108.3	30	183.7	138.4	80	223.6	168.5
31	24.8	18.7	81	64.7	48.7	131	104.6	78.8	181	144.5	108.9	231	184.5	139.0	281	224.4	169.1
32	25.6	19.3	82	65.5	49.3	32	105.4	79.4	82	145.3	109.5	32	185.3	139.6	82	225.2	169.7
33	26.4	19.9	83	66.3	49.9	33	106.2	80.0	83	146.1	110.1	33	186.1	140.2	83	226.0	170.3
34	27.2	20.5	84	67.1	50.6	34	107.0	80.6	84	146.9	110.7	34	186.9	140.8	84	226.8	170.9
35	28.0	21.1	85	67.9	51.2	35	107.8	81.2	85	147.7	111.3	35	187.7	141.4	85	227.6	171.5
36	28.7	21.7	86	68.7	51.8	136	108.6	81.8	186	148.5	111.9	236	188.5	142.0	286	228.4	172.1
37	29.5	22.3	87	69.5	52.4	37	109.4	82.4	87	149.3	112.5	37	189.3	142.6	87	229.2	172.7
38	30.3	22.9	88	70.3	53.0	38	110.2	83.0	88	150.1	113.1	38	190.1	143.2	88	230.0	173.3
39	31.1	23.5	89	71.1	53.6	39	111.0	83.6	89	150.9	113.7	39	190.9	143.8	89	230.8	173.9
40	31.9	24.1	90	71.9	54.2	40	111.8	84.2	90	151.7	114.3	40	191.7	144.4	90	231.6	174.5
41	32.7	24.7	91	72.7	54.8	141	112.6	84.9	191	152.5	114.9	241	192.5	145.0	291	232.4	175.1
42	33.5	25.3	92	73.5	55.4	42	113.4	85.5	92	153.3	115.5	42	193.3	145.6	92	233.2	175.7
43	34.3	25.9	93	74.3	56.0	43	114.2	86.1	93	154.1	116.1	43	194.1	146.2	93	234.0	176.3
44	35.1	26.5	94	75.1	36.6	44	115.0	86.7	94	154.9	116.7	44	194.9	146.8	94	234.8	176.9
45	35.9	27.1	95	75.9	57.2	45	115.8	87.3	95	155.7	117.3	45	195.7	147.4	95	235.6	177.5
46	36.7	27.7	96	76.7	57.8	146	116.6	87.9	196	156.5	117.9	246	196.5	148.0	296	236.4	178.1
47	37.5	28.3	97	77.5	58.4	47	117.4	88.5	97	157.3	118.6	47	197.3	148.6	97	237.2	178.7
48	38.3	28.9	98	78.3	59.0	48	118.2	89.1	98	158.1	119.2	48	198.1	149.2	98	238.0	179.3
49	39.1	29.5	99	79.1	59.6	49	119.0	89.7	99	158.9	119.8	49	198.9	149.8	99	238.8	179.9
50	39.9	30.1	100	79.9	60.2	150	119.8	90.3	200	159.7	120.4	250	199.7	150.4	300	239.6	180.5
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

Dist	Lat.	Dep	Dist	Lat	D	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	00.8	00.6	51	40.2	31.4	101	79.6	62.2	151	119.0	93.0	201	158.4	123.8	251	197.8	154.5
2	01.6	01.2	52	41.0	32.0	02	80.4	62.8	52	119.8	93.6	02	159.2	124.4	52	198.5	155.2
3	02.4	01.8	53	41.8	32.6	03	81.2	63,4	53	120.5	94.2	03	159.9	125.0	53	199.3	155.8
4	03.2	02,5	54	42.5	33.2	04	81.9	64,0	54	121.3	94.8	04	160.7	125.6	54	200.1	156.4
5	03.9	03.1	55	43.3	33.9	05	82.7	64.6	55	122.1	95.4	05	161.5	126.2	55	200.9	157.0
6	04.7	03.7	56	44.1	34.5	106	83.5	65.3	156	122.9	96.0	206	162.3	126.8	256	201.7	157.6
7	05.5	04.3	57	44.9	35.1	07	84.3	65.9	57	123.7	96.7	07	163.1	127.4	57	202.5	158.2
8	06.3	04.9	58	45.7	35.7	08	85.1	66.5	58	124.5	97.3	08	163.9	128.1	58	203.3	158.9
9	07.1	05.5	59	46.5	36.3	09	85.9	67.1	59	125.3	97.9	09	164.7	128.7	59	204.1	159.5
10	07.9	06.2	60	47.3	36.9	10	86.7	67.7	60	126.1	98.5	10	165.5	129.3	60	204.9	160.1
11	08.7	06.8	61	48.1	37.6	111	87.5	68.3	161	126.9	99.1	211	166.2	129.9	261	205.6	160.7
12	09.5	07.4	62	48.9	38.2	12	88.2	69.0	62	127.6	99.7	12	167.0	130.5	62	206.4	161.3
13	10.2	08.0	63	49.6	38.8	13	89.0	79.6	63	128,4	100.4	13	167.8	131.1	63	207.2	161.9
14	11.0	08.6	64	50.4	39.4	14	89.8	70.2	64	129.2	101.0	14	168.6	131.8	64	208.0	162.5
15	11.8	09.2	65	51.2	40.0	15	90.6	70.8	65	130.0	101.6	15	169.4	132.4	65	208.8	163.2
16	12.6	09,9	66	52.0	40.6	116	91.4	71.4	166	130.8	102.2	216	170.2	133.0	266	209.6	163.8
17	13.4	10.5	67	52.8	41.3	17	92.2	72.0	67	131.6	102.8	17	171.0	133.6	67	210.4	164.4
18	14.2	11.1	68	53.6	41.9	18	93.0	72.7	68	132.4	103.4	18	171.8	134.2	68	211.2	165.0
19	15.0	11,7	69	54.4	42.5	19	93.8	73.3	69	133.2	104.1	19	172.5	134.8	69	211.9	165.6
20	15.8	12.3	70	55.2	43.1	20	94.5	73.9	70	133.9	104.7	20	173.3	135.5	70	212.7	166.2
21	16.5	12.9	71	55.9	43.7	121	95,3	74.5	171	134.7	105.3	221	174.1	136.1	271	213.5	166.9
22	17.3	13.5	72	56.7	44.3	22	96.1	75.1	72	135.5	105.9	22	174.9	136.7	72	214.3	167.5
23	18.1	14.2	73	57.5	44,9	23	96.9	75.7	73	136.3	106.5	23	175.7	137.3	73	215.1	168.1
24	18.9	14.8	74	58.3	45.6	24	97.7	76.3	74	137.1	107.1	24	176.5	137.9	74	215.9	168.7
25	19.7	15.4	75	59.1	46.2	25	98.5	77.0	75	137.9	107.7	25	177.3	138.5	75	216.7	169.3
26	20.5	16.0	76	59.9	46.8	126	99,3	77.6	176	138.7	108.4	226	178.1	139.1	276	217.5	169.9
27	21.3	16.6	77	60.7	47.4	27	100.1	78.2	77	139.5	109.0	27	178.9	139.8	77	218.2	170.5
28	22.1	17.2	78	61.5	48.0	28	100.9	78.8	78	140.2	109.6	28	179.6	140.4	78	219.0	171.2
29	22.9	17.9	79	62.2	48.6	29	101.6	79.4	79	141.0	110.2	29	180.4	141.0	79	219.8	171.8
30	23.6	18.5	80	63.0	49.3	30	102.4	80.0	80	141.8	110.8	30	181.2	141.6	80	220.6	172.4
31	24.4	19.1	81	63.8	49.9	131	103.2	80.7	181	142.6	111.4	231	182.0	142.2	281	221.4	173.0
32	25.2	19.7	82	64.6	50.5	32	104.0	81.3	82	143.4	112.1	32	182.8	142.8	82	222.2	173.6
33	26.0	20.3	83	65.4	51.1	33	104.8	81.9	83	144.2	112.7	33	183.6	143.5	83	223.0	174.2
34	26.8	20.9	84	66.2	51.7	34	105.6	82.5	84	145.0	113.3	34	184.4	144.1	84	223.8	174.9
35	27.6	21.5	85	67.0	52.3	35	106.4	83.1	85	145.8	113.9	35	185.2	144.7	85	224.5	175.5
36	28.4	22.2	86	67.8	53.0	136	107.2	83.7	186	146.5	114.5	236	185.9	145.3	286	225.3	176,1
37	29.2	22,8	87	68.5	53.6	37	107.9	84.4	87	147.3	115.1	37	186.7	145.9	87	226.1	176.7
38	29.9	23.4	88	69.3	54.2	38	108.7	85.0	88	148.1	115.8	38	187.5	146.5	88	226.9	177.3
39	30.7	24.0	89	70.1	54.8	39	109.5	85,6	89	148.9	116.4	39	188.3	147.2	89	227.7	177.9
40	31.5	24.6	90	70.9	55.4	40	100.3	86.2	90	149.7	117.0	40	189.1	147.8	90	228.5	178.6
41	32.3	25.2	91	71.7	56.0	141	101.1	86.8	191	150.5	117.6	241	189.9	148.4	291	229.3	179.2
42	33.1	25.9	92	72.5	56.6	42	111.9	87.4	92	151.3	118.2	42	190.7	149.0	92	230.1	179.8
43	33.9	26.5	93	73.3	57.3	43	112.7	88.0	93	152.1	118.8	43	191.5	149.6	93	230.9	180.4
44	34.7	27.1	94	74.1	57.9	44	113.5	88.7	94	152.9	119.4	44	192.2	150.2	94	231.6	181.0
45	35.5	27.7	95	74.9	58.5	45	114.2	89.3	95	153.6	120,1	45	193.0	150.8	95	232.4	181.6
46	36.2	28.3	96	75.6	59.1	146	115.0	89.9	196	154.4	120.7	246	193.8	151.5	296	233.2	182.2
47	37.0	28.9	97	76.4	59.7	47	115.8	90.5	97	155.2	121.3	47	194.6	152.1	97	234,0	182.9
48	37.8	29.6	98	77.2	60.3	48	116.6	91.1	98	156.0	121.9	48	195.4	152.7	98	234.8	183.5
49	38.6	30.2	99	78.0	61.0	49	117.4	91.7	99	156.8	122.5	49	196.2	153.3	99	235.6	184.1
50	39.4	30.8	100	78.8	61.6	150	118.2	92.4	200	157.6	123.1	250	197.0	153.9	300	236.4	184.7
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Dep	Lat

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.8	00.6	51	39.6	32.1	101	78.5	63.6	151	117.3	95.0	201	156.2	126.5	251	195.1	158.0
2	01.6	01.3	52	40.4	32.7	02	79.3	64.2	52	118.1	95.7	02	157.0	127.1	52	195,8	158.6
3	02.3	01.9	53	41.2	33.4	03	80.0	64.8	53	118.9	96.3	03	157.8	127.7	53	196.6	159.2
4	03.1	02.5	54	42.0	34.0	04	80.8	65.4	54	119.7	96.9	04	158.5	128.4	54	197.4	159.8
5	03.9	03.1	55	42.7	34.6	05	81.6	66.1	55	120.5	97.5	05	159.3	129.0	55	198.2	160.5
6	04.7	03.8	56	43.5	35.2	106	82.4	66.7	156	121.2	98.2	206	160.1	129.6	256	198.9	161.1
7	05.4	04.4	57	44.3	35,9	07	83.1	67.3	57	122.0	98.8	07	160.9	130.3	57	199.7	161.7
8	06.2	05.0	58	45.1	36.5	08	83.9	68.0	58	122.8	99.4	08	161.6	130.9	58	200.5	162.4
9	07.0	05.7	59	35.8	37.1	09	84.7	68.6	59	123.6	100.1	09	162.4	131.5	59	201.3	163.0
10	07.8	06.3	60	46.6	37.8	10	85.5	69.2	60	124.3	100.7	10	163.2	132.2	60	202.0	163.6
11	08.5	06.9	61	47.4	38.4	111	86.3	69.9	161	125.1	101.3	211	164,0	132.8	261	202.8	164.2
12	09.3	07.6	62	48.2	39.0	12	87.0	70.5	62	125.9	101.9	12	164.7	133.4	62	203.6	164.9
13	10.1	08.2	63	49.0	39.6	13	87.8	71.1	63	126.7	102.6	13	165.5	134.0	63	204.4	165.5
14	10.9	08.8	64	49.7	40.3	14	88.6	71.7	64	127.4	103.2	14	166.3	134.7	64	205.2	166,1
15	11.7	09.4	65	50.5	40.9	15	89.4	72.4	65	128.2	103.8	15	167.1	135.3	65	205.9	166.8
16	12.4	10.1	66	51.3	41.5	116	90.1	73.0	166	129.0	104.5	216	167.9	135.9	266	206.7	167.4
17	13.2	10.7	67	52.1	42.2	17	90.9	73.6	67	129.8	105.1	17	168.6	136.6	67	207.5	168.0
18	14.0	11.3	68	52.8	42.8	18	91.7	74.3	68	130.6	105.7	18	169.4	137.2	68	208.3	168.7
19	14.8	12.0	69	53.6	43.4	19	92.5	74.9	69	131.3	106.4	19	170.2	137.8	69	209.0	169.3
20	15.5	12.6	70	54.4	44.1	20	93.3	75.5	70	132.1	107.0	20	171.0	138.4	70	209.8	169.9
21	16.3	13.2	71	55.2	44.7	121	94.0	76.1	171	132.9	107.6	221	171.7	139.1	271	210.6	170.5
22	17.1	13.8	72	56.0	45.3	22	94.8	76.8	72	133.7	108.2	22	172.5	139.7	72	211.4	171.2
23	17.9	14.5	73	56.7	45.9	23	95.6	77.4	73	134.4	108.9	23	173.3	140.3	73	212.1	171.8
24	18.7	15.1	74	57.5	46.6	24	96.4	78.0	74	135.2	109.5	24	174.1	141.0	74	212.9	172.4
25	19.4	15.7	75	58.3	47.2	25	97.1	78.7	75	136.0	110.1	25	174.8	141,6	75	213,7	173.1
26	20.2	16.4	76	59.1	47.8	126	97.9	79.3	176	136.8	110.8	226	175.6	142.2	276	214.5	173.7
27	21.0	17.0	77	59.8	48.5	27	98.7	79.9	77	137.5	111.4	27	176.4	142.9	77	215.3	174.3
28	21.8	17.6	78	60.6	49.1	28	99.5	80.6	78	138.3	112.0	28	177.2	143.5	78	216.0	174.9
29	22.5	18.2	79	61.4	49.7	29	100.2	81.2	79	139.1	112.6	29	178.0	144.1	79	216.8	175.6
30	23.3	18.9	80	62.2	50.3	30	101.0	81.8	80	139.9	113.3	30	178.7	144.7	80	217.6	176.2
31	24.1	19.5	81	62.9	51.0	131	101.8	82.4	181	140.7	113.9	231	179.5	145.4	281	218.4	176.8
32	24.9	20.1	82	63.7	51.6	32	102.6	83.1	82	141.4	114.5	32	180.3	146.0	82	219.1	177.5
33	25.6	20.8	83	64.5	52.2	33	103.4	83.7	83	142.2	115.2	33	181.1	146.6	83	219.9	178.1
34	26.4	21.4	84	65.3	52.9	34	104.1	84.3	84	143.0	115.8	34	181.8	147.3	84	220.7	178.7
35	27.2	22.0	85	66.1	53.5	35	104.9	85.0	85	143.8	116.4	35	182.6	147.9	85	221,5	179.4
36	28.0	22.7	86	66.8	54.1	136	105.7	85.6	186	144.5	117.1	236	183.4	148.5	286	222.3	180.0
37	28.8	23.3	87	67.6	54.7	37	106.5	86.2	87	145.3	117.7	37	184.2	149.1	87	223.0	180.6
38	29.5	23.9	88	68.4	55.4	38	107.2	86.8	88	146.1	118.3	38	185.0	149.8	88	223.8	181.2
39	30.3	24.5	89	69.2	56.0	39	108.0	87.5	89	146.9	118.9	39	185.7	150.4	89	224.6	181.9
40	31.1	25.2	90	69.9	36.6	40	108.8	88.1	90	147.6	119.6	40	186.5	151.0	90	225.4	182.5
41	31.9	25.8	91	70.7	57.3	141	109.6	88.7	191	148.4	120.2	241	187.3	151.7	291	226.1	183.1
42	32.6	26.4	92	71.5	57.9	42	110.3	89.4	92	149.2	120.8	42	188.1	152.3	92	226.9	183.8
43	33.4	27.1	93	72.3	58.5	43	111.1	90.0	93	150.0	121.5	43	188.8	152.9	93	227.7	184.4
44	34.2	27.7	94	73.0	59.2	44	111.9	90.6	94	150.8	122.1	44	189.6	153.6	94	228.5	185.0
45	35.0	28.3	95	73.8	59.8	45	112.7	91.2	95	151.5	122.7	45	190.4	154.2	95	229.2	185.6
46	35.7	28.9	96	74.6	60.4	146	113.5	91.9	196	152.3	123.3	246	191.2	154.8	296	230.0	186.3
47	36.5	29.6	97	75.4	61.0	47	114.2	92.5	97	153.1	124.0	47	191.9	155.4	97	230.8	186.9
43	37.3	30.2	98	76.2	61.7	48	115.0	93.1	98	153.9	124.6	48	192.7	156.1	98	231.6	187.5
49	38.1	30,8	99	76.9	62.3	49	115,8	93.8	99	154.6	125.2	49	193.5	156.7	99	232.4	188.2
50	38.9	31.5	100	77.7	62.9	150	116.6	94.4	200	155.4	125.9	250	194.3	157.3	300	233.1	188.8
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

for 51 Deg.

Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	00.8	00.6	51	39.1	32.8	101	77.4	64,9	151	115.7	97.1	201	154.0	129.2	251	192.3	161.4
2	01.5	01.3	52	39.8	33.4	02	78.1	65.6	52	116.4	97.7	02	154.7	129.9	52	193.0	162.0
3	02.3	01.9	53	40.6	34.1	03	78.9	66.2	53	117.2	98.4	03	155.5	130.5	53	193 8	162.6
4	03.1	02,6	54	41.4	34.7	04	79.7	66.8	54	118.0	99.0	04	156.3	131.1	54	194,6	163.3
5	03.8	03.2	55	42.1	35.3	05	80.4	67.5	55	118.7	99.6	05	157.0	131.8	55	195.3	163.9
6	04.6	03.9	56	42.9	36.0	106	81.2	68.1	156	119.5	100.3	206	157.8	132,4	256	196.1	164.6
7	05.4	04.5	57	43.7	36.6	07	82.0	68.8	57	120.3	100.9	07	158.6	133.1	57	196.9	165.2
8	06.1	05.1	58	44.4	37.3	08	82.7	69.4	58	121.0	101.6	08	159.3	133.7	58	197.6	165.9
9	06.9	05.8	59	45.2	37.9	09	83 5	70.1	59	121.8	102.2	09	160.1	134.4	59	198.4	166.5
10	07.7	06.4	60	46.0	38.6	10	84.3	70.7	60	122.6	102.8	10	160.9	135.0	60	199.2	167.1
11	08.4	07.1	61	46.7	39.2	111	85.0	71.3	161	123.3	193.5	211	161.6	135.6	261	199.9	167.8
12	09.2	07.7	62	47.5	39.9	12	85.8	72.0	62	124.1	104.1	12	162.4	136.3	62	200.7	168.4
13	10.0	08.4	63	48.3	40.5	13	86.6	72.6	63	124.9	104.8	13	163.2	136.9	63	201.4	169.1
14	10.7	09.0	64	49.0	41.1	14	87.3	73.3	64	125.6	105.4	14	163.9	137.6	64	202.2	169.7
15	11.5	09.6	65	49.8	41.8	15	88.1	73.9	65	126 4	106.1	15	164.7	138.2	65	203.0	170.4
16	12.3	10,3	66	50.6	42.4	116	88.9	74.6	166	127.2	106.7	216	165.4	138.8	266	203.7	171.0
17	13.0	10.9	67	51.3	43.1	17	89.6	75.2	67	127.9	107.3	17	166.2	139.5	67	204.5	171.6
18	13.8	11.6	68	52.1	43.7	18	90.4	75.9	68	128,7	108.0	18	167.0	140.1	68	205.3	172.3
19	14.6	12,2	69	52.9	44.4	19	91.2	76.5	69	129.4	108.6	19	167.7	140.8	69	206.0	172.9
20	15.3	12.9	70	53.6	45,0	20	91.9	77.1	70	130.2	109.3	20	168.5	141.4	70	206.8	173.6
21	16.1	13.5	71	54.4	45.6	121	92.7	77.8	171	131.0	109.9	221	169.3	142.1	271	207.6	174.2
22	16.9	14.1	72	55.2	46.3	22	93.4	78.4	72	131.7	110.6	22	170.0	142.7	72	208.3	174.8
23	17.6	14.8	73	55.9	46.9	23	94.2	79.1	73	132.5	111.2	23	170.8	143.3	73	209.1	175.5
24	18.4	15.4	74	56.7	47.6	24	95,0	79.7	74	133.3	111.9	24	171.6	144.0	74	209.9	176,1
25	19.2	16.1	75	57.4	48.2	25	95.7	80.4	75	134.0	112.5	25	172.3	144.6	75	210.6	176.8
26	19.9	16.7	76	58.2	48.9	126	96.5	81.0	176	134.8	113.1	226	173.1	145.3	276	211.4	177.4
27	20.7	17.4	77	59.0	49.5	27	97.3	81.6	77	135.6	113.8	27	173.9	145.9	77	212.2	178.1
28	21.4	18.0	78	59.7	50.1	28	98.0	82.3	78	136.3	114.4	28	174.6	146.6	78	212.9	178.7
29	22.2	18.6	79	60.5	50.8	29	98.8	82.9	79	137.1	115.1	29	175.4	147.2	79	213.7	179.3
30	23.0	19.3	80	61.3	51.4	30	99,6	83.6	80	137.9	115.7	30	176.2	147.9	80	214.5	180.0
31	23.7	19.9	81	62.0	52.1	131	100.3	84,2	181	138.6	116.4	231	176.9	148.5	281	215.2	180.6
32	24.5	20.6	82	62.8	52.7	32	101.1	84.9	82	139.4	117.0	32	177,7	149.1	82	216.0	181.3
33	25.3	21.2	83	63.6	53.4	33	101.9	85.5	83	140.2	117.6	33	178.5	149.8	83	216.8	181.9
34	26.0	21.9	84	64.3	54.0	34	102.6	86.1	84	140.9	118.3	34	179.2	150.4	84	217.5	182.6
35	26.8	22,5	85	65.1	54.6	35	103.4	86.8	85	141.7	118.9	35	180.0	151.1	85	218.3	183.2
36	27.6	23.1	86	65.9	55.3	136	104.2	87.4	186	142.5	119.6	236	180.8	151.7	286	219.1	183.9
37	28.3	23.8	87	66.6	55.9	37	104.9	88.1	87	143.2	120,2	37	181.5	152.4	87	219.8	184.5
38	29.1	24.4	88	67.4	56.6	38	105.7	88.7	88	144.0	120.9	38	182 3	153.0	88	220.6	185.1
39	29.9	25.1	89	68.2	57.2	39	106.5	89.4	89	144.8	121.5	39	183.1	153.6	89	221.4	185.8
40	30.6	25.7	90	68.9	57.9	40	107.2	90.0	90	145.5	122.1	40	183.8	154.3	90	222.1	186.4
41	31.4	26.4	91	69.7	58.5	141	108.0	90.6	191	146.3	122.8	241	184.6	154.9	291	222.9	187.1
42	32.2	27.0	92	70.5	59.1	42	108.8	91.3	92	147.1	123.4	42	185.4	155.6	92	223.7	187.7
43	32.9	27.6	93	71.2	59.8	43	109.5	91.9	93	147.8	124.1	43	186.1	156.2	93	224.4	188.4
44	33.7	28.3	94	72.0	60.4	44	100.3	92.6	94	148.6	124.7	44	186.9	156.9	94	225.2	189.0
45	34.5	28.9	95	72.8	61.1	45	101.1	93,2	95	149.4	125.4	45	187.7	157.5	95	226.0	189.6
46	35.2	29.6	96	73.5	61.7	146	111.8	93.9	196	150.1	126.0	246	188.4	158.1	296	226.7	190.3
47	36.0	30.2	97	74.3	62 4	47	112.6	94.5	97	150.9	126.6	47	189.2	158.8	97	227.5	190.9
48	36.8	30.8	98	75.1	63.0	48	113.4	95.1	98	151.7	127.3	48	190.0	159.4	98	228.3	191.6
49	37.5	31.5	99	75.8	63.6	49	114.1	95.8	99	152.4	127.9	49	190.7	160.1	99	229.0	192.2
50	38.3	32.1	100	76.6	64.3	150	114.9	96.4	200	153.2	128.6	250	191.5	160.7	300	229.8	192.9
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Dep	Lat

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.8	00.7	51	38.5	33.5	101	76.2	66.3	151	114.0	99.0	201	151.7	131.8	251	189.4	164.6
2	01.5	01.3	52	39.2	34.1	02	77.0	66.9	52	114.7	99.7	02	152.5	132.5	52	190.2	165.3
3	02.3	02.0	53	40.0	34.8	03	77.7	67.6	53	115.5	100.4	03	153.2	133.2	53	190.9	166.0
4	03.0	02.6	54	40,8	35.4	04	78.5	68.2	54	116.2	101.0	04	154.0	133.8	54	191.7	166.6
5	03.8	03.3	55	41.5	36.1	05	79.2	68.9	55	117.0	101.7	05	154.7	134.5	55	192.5	167.3
6	04.5	03.9	56	42.3	36.7	106	80.0	69.5	156	117.7	102.3	206	155,5	135.1	256	193.2	167.9
7	05.3	04.6	57	43.0	37.4	07	80.8	70.2	57	118.5	103.0	07	156.2	135.8	57	194.0	68.6
8	06.0	05.2	58	43.8	38.0	08	81.5	70.8	58	119.2	103.6	08	157.0	136.4	58	194.7	169.2
9	06.8	05.9	59	44.5	38.7	09	82.3	71.5	59	120.0	104.3	09	157.7	137.1	59	195.	169.9
10	07.5	06.6	60	45.3	39.4	10	83.0	72.2	60	120.8	105.0	10	158.5	137.7	60	196.2	170.5
11	08.3	07.2	61	46.0	40.0	111	83.8	72.8	161	121.5	05.6	211	159.2	138.4	261	197.0	171.2
12	09.1	07.9	62	46.8	40.7	12	84.5	73.5	62	122.3	106.3	12	160.0	139.1	62	197.7	171.9
13	09.8	08.5	63	47.5	41.3	13	85.3	74.1	63	123.0	106.9	13	160.8	139.7	63	198.5	172.5
14	10.6	09.2	64	48.3	42.0	14	86.0	74.8	64	123.8	107.6	14	161.5	140.4	64	199.2	173.2
15	11.3	09.8	65	49.1	42.6	15	86.8	75.4	65	124.5	108.2	15	162.3	141.0	65	200.0	173.8
16	12.1	10.5	66	49.8	43.3	116	87.5	76.1	166	125.3	108.9	216	163 0	141.7	266	200.8	174.3
17	12.8	11.2	67	50.6	44.0	17	88.3	76.7	67	126.0	109.5	17	163.8	142.3	67	201.5	175.1
18	13.6	11.8	68	51.3	44.6	18	89.1	77.4	68	126.8	110.2	18	164,5	143.0	68	202.3	175.8
19	14.3	12.5	69	52.1	45.3	19	89.8	78.1	69	127.5	110.9	19	165.3	143.6	69	203.0	176.4
20	15.1	13.1	70	52.8	45.9	20	90.6	78.7	70	128.3	111.5	20	166.0	144.3	70	203.8	177.1
21	15.8	13.8	71	53.6	46.6	121	91.3	79.4	171	129.1	112.2	221	166.8	145.0	271	204.5	177.8
22	16.6	14.4	72	54.3	47.2	22	92.1	80.0	72	129.8	112.8	22	167.5	145.6	72	205.3	178.4
23	17.4	15.1	73	55.1	47.9	23	92.8	80.7	73	130.6	113.5	23	168.3	146.3	73	206.0	179.1
24	18.1	15.7	74	55.8	48.5	24	93.6	81.3	74	131.3	114.1	24	169.1	146.9	74	206.8	179.7
25	18.9	16.4	75	56.6	49,2	25	94.3	82.0	75	132.1	114.8	25	169.8	147.6	75	207.5	180.4
26	19.6	17.1	76	57.4	49.9	126	95.1	82.6	176	132.8	115.4	226	170.6	148.2	276	208.3	181.0
27	20.4	17.7	77	58.1	50.5	27	95.8	83.3	77	133.6	116.1	27	171.3	148.9	77	209.1	181.7
28	21.1	18.4	78	58.9	51.2	28	96.6	84.0	78	134.3	116.8	28	172.1	149.6	78	209.8	182.4
29	21.9	19.0	79	59.6	51.8	29	97.4	84.6	79	135.1	117.4	29	172.8	150.2	79	210.6	183.0
30	22.6	19.7	80	60.4	52.5	30	98.1	85.3	80	135.8	118.1	30	173.6	150.9	80	211.3	183.7
31	23.4	20.3	81	61.1	53.1	131	98.9	85.9	181	136.6	118.7	231	174.3	151.5	281	212.1	184.3
32	24.2	21.0	82	61,9	53.8	32	99.6	86.6	82	137.4	119.4	32	175.1	152.2	82	212.8	185.0
33	24.9	21.6	83	62.6	54.4	33	100.4	87.2	83	138.1	120.0	33	175.8	152.8	83	213,6	185.6
34	25.7	22.3	84	63.4	55.1	34	101.1	87.9	84	138.9	120.7	34	176.6	153.5	84	214.3	186,3
35	26.4	23.0	85	64.2	55.8	35	101.9	88.6	85	139.6	121.4	35	177.4	154.1	85	215.1	186.9
36	27.2	23.6	86	64.9	56.4	136	102.6	89.2	186	140.4	122.0	236	178.1	154.8	286	215.8	187.6
37	27.9	24.3	87	65.7	37.1	37	103.4	89.9	87	141.1	122.7	37	178.9	155.5	87	216.6	188.3
38	28.7	24.9	88	66.4	57.7	38	104.2	90.5	88	141.9	123.3	38	179.6	156.1	88	217.4	188.9
39	29.4	25.6	89	67.2	58.4	39	104.9	91.2	89	142.6	124.0	39	180.4	156.8	89	218.1	189.6
40	30.2	26.2	90	67.9	59.0	40	105.7	91.8	90	143.4	124.6	40	181.1	157.4	90	218.9	190.8
41	30.9	26.9	91	68.7	59.7	141	106.4	92.5	191	144.2	125.3	241	181.9	158.1	291	219.6	190.9
42	31.7	27.6	92	69.4	60.4	42	107.2	93.1	92	144.9	125.9	42	182.6	158.7	92	220.4	191.5
43	32.5	28.2	93	70.2	61.0	43	107.9	93.8	93	145.7	126.6	43	183.4	159.4	93	221,1	192.2
44	33.2	28.9	94	70.9	61.7	44	108.7	94.5	94	146.4	127.3	44	184.2	160.0	94	221.9	192.8
45	34.0	29.5	95	71.7	62.3	45	109.4	95.1	95	147.2	127.9	45	184.9	160.7	95	222.6	193.5
46	34.7	30.2	96	72.5	63.0	146	110.2	95.8	196	147.9	128.6	246	185.7	161.4	296	223.4	194.2
47	35.5	30.8	97	73.2	63.6	47	110.9	96.4	97	148.7	129.2	47	186.4	162.0	97	224.2	194.8
48	36.2	31.5	98	74.0	64.3	48	111.7	97.1	98	149.4	129.9	48	187.2	162.7	98	224.9	195.5
49	37.0	32.1	99	74.7	64.9	49	112.5	97.7	99	150.2	130.5	49	187.9	163.3	99	225.7	196.1
50	37.7	31.8	100	75.5	65.6	150	113.2	98.4	200	150.9	131.2	250	188.7	164.0	300	226.4	196.8
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.7	00.7	51	37.9	34.1	101	75.0	67.6	151	112.2	101.0	201	149.3	134.5	251	186.5	167.9
2	01.5	01.3	52	38.6	34.8	02	75,8	68.2	52	112.9	101.7	02	150.1	135.1	52	187.2	168.6
3	02.2	02.0	53	39.4	35.5	03	76.5	68.9	53	113.7	102.4	03	150.8	135.8	53	187.9	169.3
4	03.0	02.7	54	40.1	36.1	04	77.3	69.6	54	114.4	103.0	04	151.5	136.5	54	188.7	169.9
5	03.7	03.3	55	40,9	36.8	05	78.0	70.2	55	115.1	103.7	05	152.3	137.1	55	189.4	170.6
6	04.5	04.0	56	41.6	37.5	106	78.7	70.9	156	115.9	104.4	206	153.0	137.8	256	190.2	171.3
7	05.2	04.7	57	42.3	38.1	07	79.5	71.6	57	116.6	105.0	07	153.8	138.5	57	190.9	171.9
8	05.9	05.4	58	43.1	38.8	08	80.2	72.3	58	117.4	105.7	08	154.5	139.1	58	191.7	172.6
9	06.7	06.0	59	43.8	39.5	09	81.0	72.9	59	118.1	106.4	09	155,3	139.8	59	192.4	173.3
10	07.4	06.7	60	44.6	40.1	10	81.7	73.6	60	118.9	107.0	10	156.0	140.5	60	193.1	173.9
11	08.2	07.4	61	45.3	40.8	111	82.5	74.3	161	119.6	107.7	211	156.7	141.2	261	193.9	174.6
12	08.9	08.0	62	46.1	41.5	12	83.2	74.9	62	120.3	108.4	12	157.5	141.8	62	194.6	175.3
13	09.7	08.7	63	46.8	42.1	13	83.9	75.6	63	121.1	109.0	13	158.2	142.5	63	195.4	175.9
14	10.4	09.4	64	47.5	42.8	14	84.7	76.3	64	121.8	109.7	14	159.0	143.2	64	196.1	176.6
15	11.1	10.0	65	48.3	43.5	15	85.4	76.9	65	122.6	110.4	15	159.7	143.8	65	196.9	177.3
16	11.9	10.7	66	49.0	44.2	116	86.2	77.6	166	123.3	111.0	216	160.5	144.5	266	197.6	177.9
17	12.6	11.4	67	49.8	44.8	17	86.9	78.3	67	124.1	111.7	17	161.2	145.2	67	198.3	178.6
18	13.4	12.0	68	50.5	45.5	18	87.7	78.9	68	124.8	112.4	18	161.9	145.8	68	199.1	179.3
19	14.1	12.7	69	51.3	46.2	19	88.4	79.6	69	125.5	113.1	19	162.7	146.5	69	199.8	180.0
20	14.9	13.4	70	52.0	46.8	20	89.1	80.3	70	126.3	113.7	20	163 4	147.2	70	200.6	180.6
21	15.6	14.0	71	52.7	47.5	121	89.9	80.9	171	127.0	114.4	221	164,2	147.8	271	201.3	181.3
22	16.3	14.7	72	53.5	48.2	22	90.6	81.6	72	127.8	115.1	22	164.9	148.5	72	202.1	182.0
23	17.1	15.4	73	54.2	48.8	23	91.4	82.3	73	128.5	115.7	23	165.7	149.2	73	202.8	182.6
24	17.8	16.1	74	55.0	49.5	24	92.1	83.0	74	129.3	116.4	24	166.4	149.9	74	203.5	183.3
25	18.6	16.7	75	55.7	50.2	25	92.9	83.6	75	130.0	117.1	25	167.1	150.5	75	204.3	184.0
26	19.3	17.4	76	56.5	50.8	126	93.6	84.3	176	130.7	117.7	226	167.9	151.2	276	205.0	184.6
27	20.1	18.1	77	57.2	51.5	27	94.3	85.0	77	131.5	118.4	27	168.6	151.9	77	205.8	185.3
28	20.8	18.7	78	57.9	52.2	28	95.1	85.6	78	132.2	119.1	28	169.4	152.5	78	206.5	186,0
29	21.5	19.4	79	58.7	52.9	29	95.8	86.3	79	133.0	119.7	29	170.1	153.2	79	207.3	186.6
30	22.3	20.1	80	59.4	53.5	30	96.6	87.0	80	133.7	120.4	30	170.9	153.9	80	208.0	187.3
31	23.0	20.7	81	60.2	54.2	131	97.3	87.6	181	134.5	121.1	231	171.6	154.5	281	208.7	188.0
32	23.8	21.4	82	60.9	54.9	32	98.1	88.3	82	135.2	121.8	32	172.3	155.2	82	209.5	188.7
33	24.5	22.1	83	61.7	55.5	33	98.8	89.0	83	135.9	122.4	33	173.1	155.9	83	210.2	189.3
34	25.3	22.7	84	62.4	56.2	34	99.5	89.6	84	136.7	123.1	34	173.8	156.5	84	211.0	190.0
35	26.0	23.4	85	63.	36.9	35	100.3	90.3	85	137.4	123.8	35	174.6	157.2	85	211.7	190.7
36	26.7	24.1	86	63.9	57.5	136	101.0	91.0	186	138.2	124.4	236	175.3	157.9	286	212.5	191.3
37	27.5	24.8	87	64.6	58.2	37	101.8	91.7	87	138.9	125.1	37	176.1	158.5	87	213,2	192.0
38	28.2	25.4	88	65.4	58.9	38	102.5	92.3	88	139.7	125.8	38	176.8	159.2	88	213.9	192.7
39	29.0	26.1	89	66.1	59.5	39	103.3	93.0	89	140.4	126.4	39	177.5	159.9	89	214.7	193.3
40	29.7	26.8	90	66.8	60.2	40	104.0	93.7	90	141.1	127.1	40	178.3	160.6	90	215.4	194.0
41	30.5	27.4	91	67.6	60.9	141	104.7	94.3	191	141.9	127.8	241	179.0	161.2	291	216.2	194.7
42	31.2	28.1	92	68.3	61.5	42	105.5	95.0	92	142.6	128.4	42	179.8	161.9	92	216.9	195.3
43	31.9	28.8	93	69.1	62.2	43	106.2	95.7	93	143.4	129.1	43	180.5	162.6	93	217.7	196.0
44	32.7	29.4	94	69.8	62.9	44	107.0	96.3	94	144.1	129.8	44	181.3	163.2	94	218.4	196.7
45	33.4	30.1	95	70.6	63.6	45	107.7	97.0	95	144.9	130.5	45	182.0	163.9	95	219.1	197.4
46	34.2	30.8	96	71.3	64.2	146	108.5	97.7	196	145.6	131.1	246	182.7	164.6	296	219.9	198.0
47	34.9	31.4	97	72.1	64.9	47	109.2	98.3	97	146.3	131.8	47	183.5	165.2	97	220.6	198.7
48	35.7	32.1	98	72.8	65.6	48	109.9	99.0	98	147.1	132.5	48	184.2	165.9	98	221,4	199.4
49	36.4	32.8	99	73.5	66.2	49	110.7	99.7	99	147.8	133.1	49	185.0	166.6	99	222.1	200.0
50	37.1	33.5	100	74.3	66.9	150	111.4	100.4	200	148.6	133.8	250	185.7	167.2	300	222.9	200.7
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.7	00.7	51	37.3	34.8	101	73.9	68.9	151	110.4	103.0	201	147.0	137.1	251	183.6	171.2
2	01.5	01.4	52	38.0	35.5	02	74.6	69.5	52	111.2	103.6	02	147.7	137.7	52	184.3	171.8
3	02.2	02.0	53	38.8	36.2	03	75.3	70.2	53	111.9	104.3	03	148.5	138.4	53	185.0	172.5
4	02.9	02.7	54	39.5	36.8	04	76.1	70.9	54	112.6	105.0	04	149.2	139.1	54	185.8	173.2
5	03.7	03.4	55	40.2	37.5	05	76.8	71.6	55	113.4	105.7	05	149.9	139.8	55	186.5	173.9
6	04.4	04.1	56	41.0	38.2	106	77.5	72.3	156	114.1	106.4	206	150.7	140.5	256	187.2	174.5
7	05.1	04.8	57	41.7	38.9	07	78.3	73.0	57	114.8	107.1	07	151.4	141.2	57	187.9	175.2
8	05.9	05.5	58	42.4	39.5	08	79.0	73.6	58	115.6	107.7	08	152.1	141.8	58	188.7	175.9
9	06.6	06.1	59	43.1	40.2	09	79.7	74.3	59	116.3	108.4	09	152.9	142.5	59	189.4	176.6
10	07.3	06.8	60	43.9	40.9	10	80.4	75.0	60	117.0	109.1	10	153.6	143.2	60	190.1	177.3
11	08.0	07.5	61	44.6	41.6	111	81.2	75.7	161	117.7	109.8	211	154.3	143.9	261	190.9	178.0
12	08.8	08.2	62	45.3	42.3	12	81.9	76.4	62	118.5	110.5	12	155.0	144.5	62	191.6	178.6
13	09.5	08.9	63	46.1	43.0	13	82.6	77.1	63	119.2	111.2	13	155.8	145.2	63	192.3	179.3
14	10.2	09.5	64	46.8	43.6	14	83.4	77.7	64	119.9	111.8	14	156.5	145.9	64	193.1	180.0
15	11.0	10.2	65	47.5	44.3	15	84.1	78.4	65	120.7	112.5	15	157.2	146.6	65	193.8	180.7
16	11.7	10.9	66	48.3	45.0	116	84.8	79.1	166	121.4	113.2	216	158.0	147.3	266	194.5	181.4
17	12.4	11.6	67	49.0	45.7	17	85.6	79.8	67	122.1	113.9	17	158.7	148.0	67	195.3	182.1
18	13.2	12.3	68	49.7	46.4	18	86.3	80.5	68	122.9	114.5	18	159.4	148.6	68	196.0	182.7
19	13.9	13.0	69	50.5	47.1	19	87.0	81.2	69	123.6	115.2	19	160.2	149.3	69	196.7	183.4
20	14.6	13.6	70	51.2	47.7	20	87.8	81.8	70	124.3	115.9	20	160.0	150.0	70	197.5	184.1
21	15.4	14.3	71	51.9	48.4	121	88.5	82.5	171	125.1	116.6	121	161.6	150.7	271	198.2	184.8
22	16.1	15.0	72	52.7	49.1	22	89.2	83.2	72	125.8	117.3	22	162.4	151.4	72	198.9	185.5
23	16.8	15.7	73	53.4	49.8	23	90.0	83.9	73	126.5	118.0	23	163.1	152.1	73	199.7	186.2
24	17.6	16.4	74	54.1	50.5	24	90.7	84.5	74	127.3	118.6	24	163.8	152.7	74	200.4	186.8
25	18.3	17.1	75	54.9	51.2	25	91.4	85.2	75	128.8	119.3	25	164.6	153.4	75	201.1	187.5
26	19.0	17.7	76	55.6	51.8	126	92.1	85.9	176	128.7	120.0	226	165.3	154.1	276	201.9	188.2
27	19.7	18.4	77	56.3	52.5	27	92.9	86.6	77	129.4	120.7	27	166.0	154.8	77	202.6	188.9
28	20.5	19.1	78	57.0	53.2	28	93.6	87.3	78	130.2	121.4	28	166.7	155.5	78	203.3	189.5
29	21.2	19.8	79	57.8	53.9	29	94.3	88.0	79	130.9	122.1	29	167.5	156.2	79	204.0	190.2
30	21.9	20.5	80	58.5	54.5	30	95.1	88.6	80	131.6	122.7	30	168.2	156.8	80	204.8	190.9
31	22.7	21.2	81	59.2	55.2	131	95.8	89.3	181	132.4	123.4	231	168.9	157.5	281	205.5	191.6
32	23.4	21.8	82	60.0	55.9	32	96.5	90.0	82	133.1	124.1	32	169.7	158.2	82	206.2	192.3
33	24.1	22.5	83	60.7	56.6	33	97.3	90.7	83	133.8	124.8	33	170.4	158.9	83	207.0	193.0
34	24.9	23.2	84	61.4	57.3	34	98.0	91.4	84	134.6	125.5	34	171.1	159.5	84	207.7	193.6
35	25.6	23.9	85	62.2	58.0	35	98.7	92.1	85	135.3	126.2	35	171.9	160.2	85	208.4	194.3
36	26.3	24.5	86	62.9	58.6	136	99.5	92.7	186	136.0	126.8	236	172.6	160.9	286	209.2	195.0
37	27.1	25.2	87	63.6	59.3	37	100.2	93.4	87	136.8	127.5	37	173.3	161.6	87	209.9	195.7
38	27.8	25.9	88	64.4	60.0	38	100.9	94.1	88	137.5	128.2	38	174.1	162.3	88	210.6	196.4
39	28.5	26.6	89	65.1	60.7	39	101.7	94.8	89	138.2	128.9	39	174.8	163.0	89	211.4	197.1
40	29.3	27.3	90	65.8	61.4	40	102.4	95.5	90	139.0	129.5	40	175.5	163.6	90	212.1	197.7
41	30.0	28.0	91	66.6	62.1	141	103.1	96.2	191	139.7	130.2	241	176.3	164.3	291	212.8	198.4
42	30.7	28.6	92	67.3	62.7	42	103.9	96.8	92	140.4	130.9	42	177.0	165.0	92	213.6	199.1
43	31.4	29.3	93	68.0	63.4	43	104.6	97.5	93	141.1	131.6	43	177.7	165.7	93	214.3	199.8
44	32.2	30.0	94	68.7	64.1	44	105.3	98.2	94	141.9	132.3	44	178.4	166.4	94	215.0	200.5
45	32.9	30.7	95	69.5	64.8	45	106.0	98.9	95	142.6	133.0	45	179.2	167.1	95	215.7	201.2
46	33.6	31.4	96	70.2	65.5	146	106.8	99.5	196	143.3	133.6	246	179.9	167.7	296	216.5	201.8
47	34.4	32.1	97	70.9	66.2	47	107.5	100.2	97	144.1	134.3	47	180.6	168.4	97	217.2	202.5
48	35.1	32.7	98	71.7	66.8	48	108.2	100.9	98	144.8	135.0	48	181.4	169.1	98	218.0	203.2
49	55.8	33.4	99	72.4	67.5	49	109.0	101.6	99	145.5	135.7	49	182.1	169.8	99	218.7	203.9
50	36.6	34.1	100	73.1	68.2	150	109.7	102.3	200	146.3	136.4	250	182.8	170.5	300	219.4	204.6
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

for 47 Deg.

Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep	Dist	Lat.	Dp.	Dist	Lat	Dep	Dist	Lat.	Dep
1	00.7	00.7	51	36.7	35.4	101	72.6	70.2	151	108.6	104.9	201	144.6	139.6	251	180.5	174.3
2	01.4	01.4	52	37.4	36.1	02	73.4	70.8	52	109.3	105.6	02	145.3	140.3	52	181.3	175.0
3	02.2	02.1	53	38.1	36.8	03	74.1	71.5	53	110.1	106.3	03	146.0	141.0	53	182.0	175.7
4	02.9	02,8	54	38.8	37.5	04	74.8	72.2	54	110.8	107.0	04	146.7	141.7	54	182.7	176,4
5	03.6	03.5	55	39.6	38.2	05	75.5	72.9	55	111.5	107.7	05	147.5	142.4	55	183.4	177.1
6	04.3	04.2	56	40.3	38.9	106	76.2	73 6	156	112.2	108.4	206	148.2	143.1	256	184.1	177.8
7	05.0	04.9	57	41.0	39.6	07	77.0	74.3	57	112.9	109.1	07	148.9	143.8	57	184.9	178.5
8	05.8	05.6	58	41.7	40.3	08	77.7	75.0	58	113.6	109.7	08	149.6	144.5	58	185.6	179.2
9	06.5	06.3	59	42.4	41.0	09	78.4	75.7	59	114.4	110.4	09	150.3	145.2	59	186.3	179.9
10	07.2	06.9	60	43.2	41.7	10	79.1	76.4	60	115.1	111.1	10	151.1	145.9	60	187.0	180.6
11	07.9	07.6	61	43.9	42.4	111	79.8	77.1	161	115 8	111.8	211	151.8	146.6	261	187.7	181.3
12	08.6	08.3	62	44.6	43.1	12	80.6	77.8	62	116.5	112.5	12	152.5	147.3	62	188.5	182.0
13	09.4	09 0	63	45.3	43.8	13	81.3	78.5	63	117.2	113.2	13	153.2	147.9	63	189.2	182.7
14	10.1	09.7	64	46.0	44.5	14	82.0	79.2	64	118.0	113.9	14	133.9	148.6	64	189.9	183.4
15	10.8	10.4	65	46.8	45,1	15	82.7	79.9	65	118.7	114.6	15	154.6	149.3	65	190.6	184.1
16	11.5	11.1	66	47.5	45.8	116	83 4	80.6	166	119.4	115.3	216	155.4	150.0	266	191.3	184.8
17	12.2	11.8	67	48.2	46.5	17	84.2	81.3	67	120.1	116.0	17	156.1	150.7	67	192.1	185.5
18	12.9	12,5	68	48.9	47.2	18	84.9	82.0	68	120.8	116.7	18	156.8	151.4	68	192.8	186.1
19	13.7	13.2	69	49.6	47.9	19	85.6	82 7	69	121.6	117.4	19	157.5	152.1	69	193.5	186.8
20	14.4	13.9	70	50.4	48.6	20	86.3	83.4	70	122.3	118.1	20	158.2	152.8	70	194 2	187.5
21	15.1	14.6	71	51.1	49.3	121	87.0	84,0	171	123.0	118.8	221	159.0	153.5	271	194,9	188.2
22	15.8	15.3	72	51.8	50.0	22	87.8	84.7	72	123.7	119.5	22	159.7	154.2	72	195.6	188.9
23	16.5	16.0	73	52.5	50.7	23	88.5	85.4	73	124.4	120,2	23	160.4	154.9	73	196.4	189.6
24	17.3	16.7	74	53.2	51.4	24	89.2	86.1	74	125.2	120.9	24	161.1	155.6	74	197.1	190.3
25	18.0	17.4	75	53.9	52.1	25	89.9	86.8	75	125.9	121.6	25	161.8	156.3	75	197.8	191.0
26	18.7	18.1	76	54.7	52.8	126	90.6	87.5	176	126.6	122.2	226	162.6	157.0	276	198.5	191.7
27	19.4	18.8	77	55.4	53.5	27	91.4	88.2	77	127.3	122.9	27	163.3	157.7	77	199.2	192.4
28	20.1	19.4	78	56.1	54.2	28	92.1	88.9	78	128.0	123.6	28	164.0	158.4	78	200.0	193.1
29	20.9	20.1	79	56.8	54.9	29	92.8	89.6	79	128,8	124.3	29	164.7	159.1	79	200.7	193.8
30	21.6	20.8	80	57.5	55.6	30	93.5	90.3	80	129.5	125.0	30	165.4	159.8	80	201.4	194.5
31	22.3	21.5	81	58.3	56.3	131	94.2	91.0	181	130.2	125.7	231	166.2	160.4	281	202.1	195.2
32	23.0	22.2	82	59.0	57.0	32	94.9	91.7	82	130.9	126.4	32	166.9	161.1	82	202.8	195.9
33	23.7	22,9	83	59.7	57.7	33	95,7	92.4	83	131.6	127.1	33	167.6	161.8	83	203.6	196.6
34	24.5	23.6	84	60.4	58.3	34	96.4	93,1	84	132.4	127.8	34	168.3	162.5	84	204.3	197.3
35	25.2	24.3	85	61.1	59.0	35	97.1	93.8	85	133.1	128.5	35	169.0	163.2	85	205.0	198.0
36	25.9	25.0	86	61.9	59.7	136	97.8	94.5	186	133.8	129.2	236	169.8	163.9	286	205.7	198.7
37	26.6	25.7	87	62.6	60.4	37	98.5	95.2	87	134.5	129.9	37	170.5	164.6	87	206.4	199.3
38	27.3	26.4	88	63.3	61.1	38	99,3	95.9	88	135.2	130.6	38	171.2	165.3	88	207.2	200.0
39	28.1	27.1	89	64.0	61.8	39	100.0	96.5	89	135.9	131.3	39	171.9	166.0	89	207.9	200.7
40	28.8	27.8	90	64.7	62 5	40	100.7	97.2	90	136.7	132.0	40	172.6	166.7	90	208.6	201.4
41	29.5	28.5	91	65.5	63.2	141	101.4	97.9	191	137.4	132.7	241	173.4	167.4	291	209.3	202.1
42	30.2	29.2	92	66.2	63.9	42	102.1	98.6	92	138.1	133.4	42	174.1	168.1	92	210.0	202.8
43	30.9	29.9	93	66.9	64.6	43	102.9	99.3	93	138.8	134.1	43	174.8	168.8	93	210.8	203.5
44	31.6	30.6	94	67.6	65.3	44	103.6	100.0	94	139.5	134.8	44	175.5	169.5	94	211.5	204.2
45	32.4	31.3	95	68.3	66.0	45	104.3	100.7	95	140.3	135.4	45	176.2	170.2	95	212.2	204.9
46	33.1	32.0	96	69.1	66.7	146	105.0	101.4	196	141.0	136.1	246	176.9	170.9	296	212.9	205.6
47	33.8	32.6	97	69.8	67.4	47	105.7	102.1	97	141.7	136.8	47	177,7	171.6	97	213.6	206.3
48	34.5	33.3	98	70.5	68.1	48	106.5	102.8	98	142.4	137.5	48	178.4	172,3	98	214.4	207.0
49	35.2	34.0	99	71.2	68.8	49	107.2	103.5	99	143.1	138.2	49	179.1	173.0	99	215.1	207.7
50	36.0	34.7	100	71.9	69.5	150	107.9	104,2	200	143.9	138.9	250	179.8	173.6	300	215.8	208.4
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Dep	Lat

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.7	00.7	51	36.1	36.1	101	71.4	71.4	151	106.8	106.8	201	142.1	142.1	251	177.5	177.5
2	01.4	01.4	52	36.8	36.8	02	72.1	72.1	52	107.5	107.5	02	142.8	142.8	52	178.2	178.2
3	02.1	02.1	53	37.5	37.5	03	72.8	72.8	53	108.2	108.2	03	143.5	143.5	53	178.9	178.9
4	02.8	02.8	54	38.2	38.2	04	73.5	33.5	54	108.9	108.9	04	144.2	144.2	54	179.6	179.6
5	03.5	03.5	55	38.9	38.9	05	74.2	74.2	55	109.6	109.6	05	144.9	144.9	55	180.3	180.3
6	04.2	04.2	56	39.6	39.6	106	74.9	74.9	156	110.3	110,3	206	145.7	145.7	256	181 0	181.0
7	04.9	04.9	57	40.3	40.3	07	75.7	75.7	57	111 0	111.0	07	146.4	146.4	57	181.7	181.7
8	05.7	05.7	58	41.0	41.0	08	76.4	76.4	58	111.7	111.7	08	147.1	147.1	58	182.4	182.4
9	06.4	06.4	59	41.7	41.7	09	77.1	77.1	59	112.4	112.4	09	147.8	147.8	59	183.1	183.1
10	07.1	07.1	60	42.4	42.4	10	77.8	77.8	60	113.1	113.1	10	148.5	148.5	60	183.8	183.8
11	07.8	07.8	61	43.1	43.1	111	78.5	78.5	161	113.8	113.8	211	149.2	149.2	261	184.5	184.5
12	08.5	08.5	62	43.8	43.8	12	79.2	79.2	62	114.5	114.5	12	149.9	149.9	62	185.3	185.3
13	09.2	09.2	63	4.5	44.5	13	79.9	79.9	63	115.3	115.3	13	150.6	150.6	63	186.0	186.0
14	09.9	09.9	64	45.3	45.3	14	80.6	80.6	64	116.0	116.0	14	151.3	151.3	64	186.7	186.7
15	10.6	10.6	65	46.1	46.1	15	81.3	81,3	65	116.7	116.7	15	152.0	152.0	65	187.4	187.4
16	11.3	11.3	66	46.7	46.4	116	82.0	82.0	166	117.4	117.4	216	152.7	152.7	266	188.1	188.1
17	12.0	12.0	67	47.4	47.4	17	82.4	82.4	67	118.1	118.1	17	153.4	153.4	67	188.8	188.8
18	12.4	12.7	68	48.1	48.1	18	83.7	83.7	68	118.8	118.8	18	154.1	154.1	68	189.5	189.5
19	13.7	13.4	69	48.8	48.8	19	84.1	84.1	69	119.5	119.5	19	154.8	154.8	69	190.2	190.2
20	14.1	14.1	70	49.5	49.5	20	84.8	84.8	70	120.2	120.2	20	155.6	155.6	70	190.9	190.9
21	14.8	14.8	71	50.2	50.2	121	85.6	85.6	171	120.9	120.9	221	156.3	156.3	271	191.6	191.6
22	15.6	15.6	72	50.9	50.9	22	86.3	86.3	72	121.6	121.6	22	157.0	157.0	72	192.3	192.3
23	16.3	16.3	73	51.6	51.6	23	87.0	87.0	73	122.3	122.3	23	157.7	157.7	73	193.0	193.0
24	17.0	17.0	74	52.3	52.3	24	87,7	87.7	74	123.0	123.0	24	158.4	158.4	74	193.7	193.7
25	17.7	17.7	75	53.0	53.0	25	88.4	88,4	75	123.7	123.7	25	159.1	159.1	75	194.4	194.4
26	18.4	18.4	76	53.7	53.7	126	89.1	89.1	176	124.4	124.4	226	159.8	159.8	276	155.2	195.2
27	19.1	19.1	77	54.4	54 4	27	89.8	89.8	77	125.2	125.2	27	160.5	160.5	77	195.9	195.9
28	19.8	19.8	78	55.2	55.2	28	90.5	90.5	78	125.9	125.9	28	161.2	161.2	78	196.6	196.6
29	20 5	20 5	79	55.9	55.9	29	91.2	91.2	79	126.6	126.6	29	161.9	161.9	79	197.3	197.3
30	21.2	21.2	80	56.6	56.6	30	91.9	91.9	80	127.3	127,3	30	162.6	162.6	80	198.0	198.0
31	21.9	21.9	81	57.3	57.3	131	92.6	12.6	181	128.0	128.0	231	163.3	163.3	281	198.7	198.7
32	22.3	22.3	82	58.0	58.0	32	93.3	93.3	82	128.7	128.7	32	164.0	164.0	82	199.4	199.4
33	23 6	23.6	83	58.7	58.7	33	94.0	94.0	83	129.4	129.4	33	164.7	164.7	83	200.1	200.1
34	24.0	24.0	84	59.4	59.4	34	94 7	94.7	84	130.1	130.1	34	165.5	165.5	84	200.8	200.8
35	24.7	24.7	85	60.1	60.1	35	95,5	95.5	85	130.8	130.8	35	166.2	166.2	85	201.5	201.5
36	25.5	25.5	86	60.8	60 8	136	96.2	96.2	186	131.5	131.5	236	166.9	166.9	286	202.2	202 2
37	26.2	26.2	87	61,5	61.5	37	96.9	96.9	87	132.2	132.2	37	167.6	167.6	87	202.9	202.9
38	26.9	26.9	88	62.2	62.2	38	97.6	97.6	88	132.9	132.9	38	168.3	168.3	88	203.6	203.6
39	27 6	27.6	89	62.9	62.9	39	98.3	98.3	89	133.6	133.6	39	169.0	169.0	89	204.3	204.3
40	28.3	28.3	90	63.6	63.6	40	99.0	99.0	90	134.3	134.3	40	169.7	169,7	90	205.1	205.1
41	29.0	29.0	91	64.3	64.3	141	99,7	99.7	191	135.1	135.1	241	170.4	170.4	291	205.8	205.8
42	29.7	29.7	92	65.1	65.1	42	100.4	100.4	92	135.8	135.8	42	171.1	171.1	92	206.5	206.5
43	30.4	30.4	93	65.8	65.8	43	101.1	101.1	93	136.5	136.5	43	171.8	171.8	93	207.2	207.2
44	31.1	31.1	94	66.5	66.5	44	101.8	101.8	94	137.2	137.2	44	172.5	172.5	94	207.9	207.9
45	31.8	31.8	95	67.2	67.2	45	102.5	102.5	95	137.9	137.9	45	173.2	173,2	95	208.6	208.6
46	32.5	32.5	96	67.9	67.9	146	103.2	103.2	196	138.6	138.6	246	173.9	173.9	296	209.3	209.3
47	33.2	33.2	97	68.6	68.6	47	103.9	103.9	97	139.3	139.3	47	174.6	174.6	97	210.0	210.0
48	34.9	33.9	98	69.3	69.3	48	104.6	104.6	98	140.0	140.0	48	175.4	175.4	98	210.7	210.7
49	34.6	34.6	99	70.0	70.0	49	105.4	105.4	99	140.7	140.2	49	176.1	176.1	99	211.4	211.4
50	35.4	35.4	100	70.7	70,7	50	106.1	106.1	200	141.4	141.4	50	176.8	176.8	300	212.1	212.1
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

Numbers for the readier finding the Course in the foregoing Tables of Difference of Latitude and Departure.

Dist. and Diff. Lat.			
N°	Deg.	N°	Deg.
1000	1	17	89
999	2	35	88
998	3	52	87
997	4	70	86
996	5	87	85
995	6	105	84
993	7	122	83
990	8	139	82
988	9	156	81
985	10	173	80
982	11	191	79
978	12	208	78
974	13	225	77
970	14	242	76
966	15	259	75
961	16	276	74
956	17	292	73
951	18	309	72
945	19	326	71
940	20	342	70
934	21	358	69
927	22	375	68
921	23	391	67
914	24	407	66
906	25	423	65
899	26	438	64
891	27	454	63
883	28	470	62
875	29	485	61
866	30	500	60
858	31	515	59
848	32	530	58
839	33	545	57
829	34	559	56
819	35	574	55
809	36	588	54
799	37	602	53
788	38	616	52
777	39	629	51
766	40	643	50
755	41	656	49
743	42	669	48
731	43	682	47
719	44	695	46
707	45	707	45

Dist. and Departure			
N°	Deg.	N°	Deg
17	1	1000	89
35	2	999	88
52	3	998	87
70	4	997	86
87	5	996	85
105	6	995	84
122	7	993	83
139	8	990	82
156	9	988	81
173	10	985	80
191	11	982	79
208	12	978	78
225	13	974	77
242	14	970	76
259	15	966	75
276	16	961	74
292	17	956	73
309	18	951	72
326	19	945	71
342	20	940	70
358	21	934	69
375	22	927	68
391	23	921	67
407	24	914	66
423	25	806	65
438	26	899	64
454	27	891	63
470	28	883	62
485	29	875	61
500	30	866	60
515	31	857	59
530	32	848	58
545	33	839	57
559	34	829	56
574	35	819	55
588	36	809	54
602	37	799	53
616	38	788	52
629	39	777	51
643	40	766	50
656	41	755	49
669	42	743	48
682	43	731	47
695	44	719	46
707	45	707	45

Diff. of Lat. and Dep.			
N°	Deg	N°	Deg.
2	1	5882	89
3	2	2855	88
5	3	1908	87
7	4	1432	86
9	5	1145	85
10	6	950	84
12	7	816	83
14	8	711	82
16	9	632	81
18	10	568	80
19	11	515	79
21	12	470	78
23	13	433	77
25	14	401	76
27	15	373	75
29	16	349	74
30	17	328	73
32	18	308	72
34	19	290	71
36	20	275	70
38	21	260	69
40	22	248	68
42	23	236	67
45	24	225	66
47	25	214	65
49	26	205	64
51	27	196	63
53	28	188	62
55	29	180	61
58	30	173	60
60	31	166	59
62	32	160	58
65	33	154	57
67	34	148	56
70	35	143	55
73	36	138	54
75	37	133	53
78	38	128	52
81	39	123	51
84	40	119	50
87	41	115	49
90	42	111	48
93	43	107	47
96	44	103	46
100	45	100	45

The Uſe of the Tables of Difference of Latitude and Departure, in working any of the Caſes of Plane Sailing.

IN theſe Tables the Courſe if leſs than 4 Points, or 45 Degrees, will be found at the Top of the Tables; but, if it is more than 4 Points, or 45 Degrees, it will be found at the Bottom of the Tables; and on every Side there are ſix Columns for the Diſtances, marked Diſt. which contains 50 Miles in each Column, the firſt beginning at 1, and ending at 50; the ſecond beginning at 51, and ending at 100, and ſo on to 300 Miles Diſtance; and to each of theſe Columns of Diſtances there being two other Columns, ſhewing the Difference of Latitude and Departure to any of the Diſtances marked Lat. and Dep. in which you are to obſerve, that if your Courſe be found at the Top of the Tables, then you are to take the Difference of Latitude and Departure as they are mark'd at Top; but if you Courſe be found at Bottom, then you muſt take them as they are marked at Bottom.

Note, If any Caſe where the Courſe is given in Points, half Points, or Quarters, your muſt make Uſe of the following Tables of Difference of Latitude and Departure, which are calculated for Points, &c. but where the Courſe is given in Degrees, or where it is not given at all, you muſt make Uſe of the foregoing Tables of Difference of Latitude and Departure.

PLANE SAILING.

CASE the Firſt.

Courſe and Diſtance being given, to find the Difference of Latitude and Departure.

RULE.

Find your Courſe as before directed, and look in ſome of the Diſtance Columns belonging to that Courſe, for your Diſtance, the Difference of Latitude and Departure anſwering to that Diſtance, will be the Difference of Latitude and Departure required.

EX-

EXAMPLE I.

A Ship ſails NNE. 136 *Miles, I demand her Difference of Latitude and Departure.*

Having found my Courſe, which is 2 Points in the Table for Points, I find my Diſtance 136 in the third Column for Diſtances, and right againſt that, I find 125.7 Tenths for my Difference of Latitude, and 52.0 Tenths for my Departure.

Note, In all Caſes whatſoever, if the given Side or Sides be in Miles, then the Sides found by the Table, will alſo be in Miles; but, if the given Side or Sides be Leagues, then the Sides found will alſo be Leagues.

Plane Sailing. Caſe the Second.

Courſe and Difference of Latitude being given, to find the Diſtance and Departure.

RULE.

Find your Courſe as before, then look in ſome of the Difference of Latitude Columns belonging to that Courſe for your Difference of Latitude, the Diſtance and Departure anſwering to that Difference of Latitude, will be the Diſtance and Departure required.

EXAMPLE II.

A Ship ſails S. 48 *Degrees* 00 *Minutes E. until her Difference of Latitude be* 164 *Leagues, I demand her Diſtance and Departure.*

Having found my Courſe 48 Degrees at the Bottom of the Tables, I look in ſome of the Columns marked Lat. at Bottom, for the neareſt I can find to my Difference of Latitude, which is 163.9, and anſwering to that, I find for my Diſtance 245 Leagues, and for my Departure 182.0 Leagues.

Plane Sailing, Caſe the Third.

Courſe and Departure being given, to find the Diſtance and Difference of Latitude.

RULE.

Find your Courſe as before, then look in ſome of the Departure Columns belonging to that Courſe, for your Departure, the Diſtance and

and Difference of Latitude anſwering to that Departure, will be the Diſtance and Difference of Latitude required.

EXAMPLE.

A Ship ſails South Weſt by South until her Departure be 165 *Miles: I demand her Diſtance and Difference of Latitude.*

Having found the Courſe, which is two Points at the Top of the Table for Points, I look in ſome of the Columns marked *Dep.* at Top, for the neareſt I can find to my Departure, which is 165.0, and anſwering to that, I find for my Diſtance 297 Miles, and for my Difference of Latitude 246.9 Miles.

Note. In any Caſe where the given Side is too large to be found in the Tables, then divide it by 2, 3, 4, or any other Number that will make it ſmall enough to be found, and then the required Sides, when found, muſt be multiplied by the ſame Number; but the Courſe muſt never be multiplied nor divided.

Plane Sailing. Caſe the Fourth.

Diſtance and Difference of Latitude being given, to find the Courſe and Departure.

RULE.

Put two Cyphers to the Difference of Latitude, and divide it by the Diſtance (without taking any Notice of the Comma that ſtands between the Miles and Tenths) and note the Quotient: Then look in the Table of Numbers (at the End of the Tables of Difference of Latitude and Departure) in the Columns belonging to Diſtance and Difference of Latitude, for the neareſt Number to that Quotient, the Degrees anſwering to that Number will be the Courſe. Then, to find the Departure, proceed as in Caſe the firſt. But here you are to obſerve, that in all Caſes where the Courſe is to be found by the Table of Numbers, the Difference of Latitude and Departure are ſuppoſed always to be in Miles and Tenths, as for Example, 112.4 Tenths, 207.9 Tenths, *&c.* ſo that if at any Time either of them ſhould be given in Miles without Tenths, as 117, 124, *&c.* you are then to put a Cypher to them, to ſupply the Place of Tenths, and call them 117.0 Tenths, 124,0 Tenths, *&c.* and then put two Cyphers more, according to your other Rules, to find the Number for the Courſe.

EXAMPLE.

A Ship ſails between the North and Weſt, until her Diſtance is 276 *Miles, and her Difference of Latitude* 211.4 *Miles, I demand her Courſe and Departure.*

Having put two Cyphers to the Difference of Latitude, which makes it 211400, I divide by the Diſtance 276, and find the Quotient to be 766 nearly; then I look in the Table of Numbers, (under *Diſt. and Diff. of Lat.*) for the neareſt to it, which is 766, againſt which I find 40 Degrees for my Courſe, and with that Courſe, and my given Diſtance, I find my Departure to be 177.4 Miles, by Caſe the firſt.

Plane Sailing, Caſe the Fifth.

Diſtance and Departure being given, to find the Courſe and Difference of Latitude.

RULE.

Put two Cyphers to the Departure, then divide it by the Diſtance, and look in the Table of Numbers, in the Columns belonging to Diſtance and Departure, for the neareſt Number to the Quotient; the Degrees anſwering to that Number will be the Courſe, and then the Difference of Latitude may be found, by Caſe the firſt.

EXAMPLE.

A Ship ſails between the South and Eaſt, until her Diſtance is 546 *Miles, and her Departure* 412 *Miles, I demand her Courſe and Difference of Latitude.*

Having put a Cypher to my Departure to ſupply the Place of Tenths, which makes it 412.0, and then two more Cyphers, according to the Rule for this Caſe, which makes it 412000, I divide it by the Diſtance 546, and find the Quotient to be 754, againſt the neareſt to which, *viz.* 755, in the Table of Numbers, under *Diſt.* and *Dep.* I find 49 Degrees for my Courſe; and with that Courſe and my Diſtance (divided by 2, becauſe it is too big to be found in the Tables) I find a Difference of Latitude 179,1 (by Caſe the firſt) which multiplied by 2, becauſe the Diſtance was divided by 2, gives 358,2 for my whole Difference of Latitude.

Plane

Plane Sailing, Caſe the Sixth.

Difference of Latitude and Departure being given, to find the Courſe and Diſtance.

RULE.

Put two Cyphers to the Departure, and divide it by the Difference of Latitude, then look in the Table of Numbers, in the Columns belonging to Difference of Latitude and Departure, for the neareſt Number to the Quotient, the Degrees anſwering to that Number will be the Courſe, then to find the Diſtance, proceed as in Caſe the Second or Third.

EXAMPLE.

A Ship ſails between the North and Weſt, till her Difference of Latitude is 184 *Miles, and her Departure* 115 *Miles, I demand her Courſe and Diſtance.*

Having ſupplied the Place of Tenths in both theſe Sides, which makes them 184.0 and 115.0, I then put two Cyphers to the Departure, which makes it 11500⊙, and divide it by the Difference of Latitude 1840, and find the Quotient to be 62; againſt which, in the Table of Numbers, under Difference of Latitude and Departure, I find 32 Degrees for my Courſe, and with that Courſe, and my Difference of Latitude, (by Caſe the Second) or with that Courſe, and my Departure (by Caſe the Third) I find my Diſtance to be 217 Miles.

Note. By theſe foregoing Rules for *Plane Sailing*, you may work any Caſe in Traverſe, Mercator, Parallel and Middle Latitude, only by ſuppoſing the Names of the Sides and Angles in Mercator, Parallel and Middle Latitude, to be changed into the Sides and Angles they repreſent in *Plane Sailing*.

TRAVERSE SAILING.

The ſeveral Courſes and Diſtances a Ship ſails being given, to find what direct Courſe and Diſtance ſhe has made good, and her Difference of Latitude and Departure.

RULE.

Make a Table as on the following Side, and ſet down in it your ſeveral Courſes and Diſtances; then, by the Rule for Caſe the Firſt of *Plane Sailing*, find the Difference of Latitude and Departure to each

of the Courſes and Diſtances, and ſet them down in the Table oppoſite to the Courſes they belong to, taking Notice that the Difference of Latitude muſt always be ſet in the North Column, if the Courſe be Northerly, and in the South Column, if the Courſe be Southerly; and the Departure muſt always be put in the Eaſt Column, if the Courſe be Eaſterly, and in the Weſt Column, if it be Weſterly.

Then add up all your Columns of North, South, Eaſt, and Weſt ſeparately, and ſet down their reſpective Sums at the Bottom of each Column; and if you have but one Column of Northing or Southing, and but of one Eaſting or Weſting, then their Sums will be the Difference of Latitude and Departure of the ſame Name with the Column they ſtand under: That is, the Difference of Latitude will be Northerly, if it ſtands under the North Column; and the Departure Eaſterly, if it ſtands under the Eaſt Column, *&c.*

But if you have Numbers in all the Columns of North, South, Eaſt, and Weſt, then take the Sums of the North and South Columns, and ſubſtract the Leſs from the Greater, the Remainder will be the Difference of Latitude, of the ſame Name with the greater of them: Alſo do the ſame with the Sums of the Eaſt and Weſt Columns for the Departure; then, with that Difference of Latitude and Departure, find the Courſe and Diſtance, as in Caſe the Sixth of *Plane Sailing*.

EXAMPLE.

A Ship ſails the following Courſes, viz. *S.S.W.* 54 *Miles*, *W. by S.* 39 *N. W. by N.* 40 *N.E. by E.* 69, *and N.N.W.* 60 *Miles*; *I demand her direct Courſe, Diſtance, Difference of Latitude, and Departure.*

		Diff. of Lat.		Departure	
Courſes	Diſt.	North	South	Eaſt	Weſt.
S S W	54		49.9		20.7
W by S	39		7.6		38.2
NW by N	40	33.3			22.2
NE by E	69	38.3		57.4	
N N W	60	55.4			23.0
		127.0	57.5	57.4	104.1
		57.5			57.4
Diff. Lat	N.ly	69.5	Dep	W.erly	46.7

Note, 'Tis by this Method that the Difference of Latitude and Departure are found in working any Day's Work at Sea; and from the Difference of Latitude and Departure ſo found, we find the Courſe, Diſtance, and Latitude by Dead-Reckoning, Meridian Diſtance and Longitude made; all which will be further explained in the Rules for keeping a Journal. Courſe N. 34.00 W. Diſtance 84 Miles.

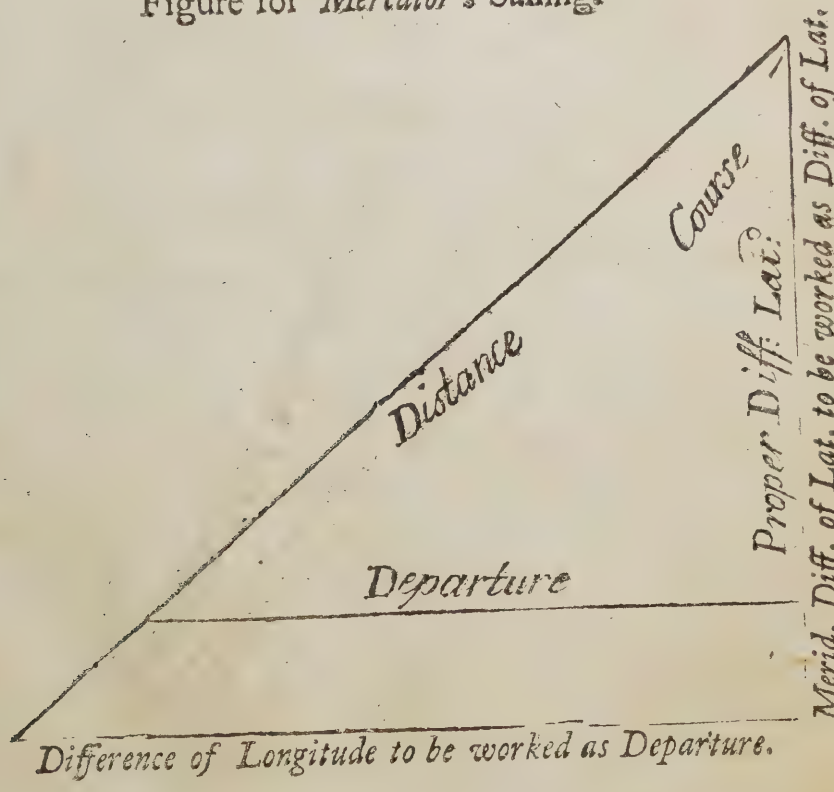
To

To work any Right-angled Triangle by the foregoing Rules for PLANE SAILING.

In all Right-angled Triangles that are to be worked by the Tables, you are to ſuppoſe four Things, *viz.* Courſe, Diſtance, Difference of Latitude, and Departure, two of which muſt always be given to find the other two: Then, as theſe Rules are wrote for working of *Plane Sailing*, if you would work any other Sailing by them, as Mercator, Parallel, Middle Latitude, or any other Right-angled Triangle, you muſt ſuppoſe that the Sides and Angles of that Triangle are to be called by the ſame Name that the Sides and Angles they repreſent in *Plane Sailing* are called by, and then work them as if it was a Caſe of *Plane-Sailing*.

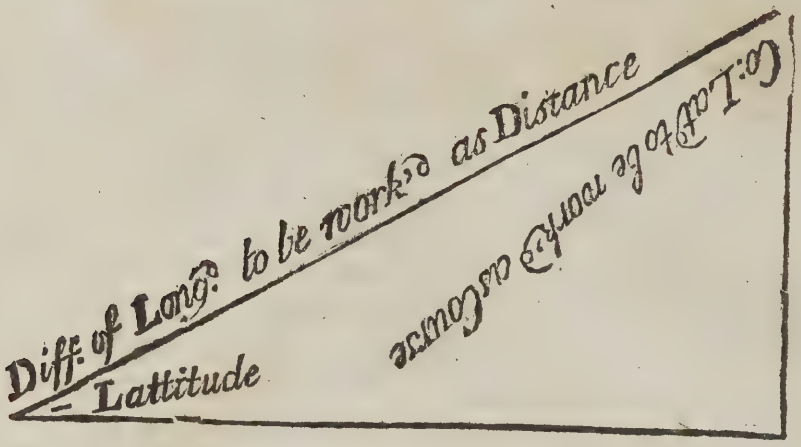
As for Example. The North and South Line is any Right-angled Triangle (by whatever Name it is called in the Sailing it belongs to) muſt be worked as if it was Difference of Latitude in *Plane Sailing*: The Eaſt and Weſt Line as Departure; the long Side as Diſtance, and the Angle oppoſite to the Eaſt and Weſt Line as Courſe. For Example, ſee the following Figures.

Figure for *Mercator*'s Sailing.


Course
Distance
Proper Diff. Lat.
Merid. Diff. of Lat. to be worked as Diff. of Lat.
Departure
Difference of Longitude to be worked as Departure.

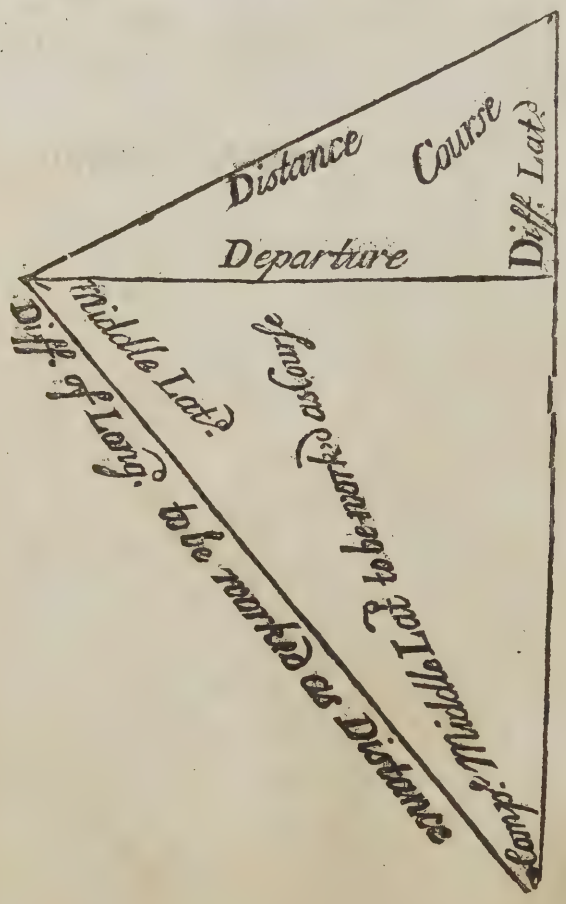
Figure

Figure for *Parallel Sailing.*



Distance to be worked at Departure.

Figure for *Middle Latitude Sailing.*



Mercator

Mercator's Sailing. Case the First.

The Latitudes and Longitudes of any two Places being given, to find what Course and Distance a Ship must sail from one Place to the other.

RULE.

Having the two Latitudes and two Longitudes given, find the proper Difference of Latitude, the meridional Difference of Latitude, and the Difference of Longitnde, as by the Rules for that Purpose; then, with the meridional Difference of Latitude, and the Difference of Longitude (taken as Difference of Latitude and Departue) find the Course by the Sixth Case of *Plane Sailing*, and with that Course, and the proper Difference of Latitude, find the Distance by Case the Second of *Plane Sailing*.

EXAMPLE.

What Course and Distance must a Ship sail from a Place in Latitude 50.00 *North, and Longitude* 03.10 *West, to a Place in Latitude of* 17.10 *North, and Longitude* 59.11 *West.*

Lat. sailed from ——	50 00 N.	Meridional Parts.	Long sailed from —	03 10W.
Lat. bound to ——	17 10 N.	3474	Long. bound to —	59 11W.
	32 50 N.	1046		56 01W.
	60	2428		60
Proper Diff. of Lat.	1970 Miles.	Mer. Diff. of Lat.	Diff. of Long.	3361 Miles

Having put Two Cyphers to the Difference of Longitude, and divided it by the Meridional Difference of Latitude, I find the Quotient to be 138, against which, in the Table of Numbers (under Difference of Latitude and Departure) I find 54 Degrees for my Course, and with that Course and my proper Difference of Latitude, I find my Distance to be 3348 Miles.

The Course being thus found in Degrees, I want, in the next Place, to know which Quarter of the Compass it is in, that is, whether it be so many Degrees from the North towards the East, or from the North towards the West, *&c.* To do which, take the following Rule.

If you are to sail from a greater North Latitude to a less, or from North Latitude into South; or from a lesser South Latitude to a greater, then you must sail to the Southward.

But if you are to sail from a greater South Latitude to a less, or from South Latitude into North; or from a less North Latitude to a greater, you must sail Northward.

If

If you are to ſail from a greater Eaſt Longitude to a leſs, or from a leſs Weſt Longitude to a greater, or from Eaſt Longtiude into Weſt, you muſt ſail to the Weſtward, except the Difference of Longitude be more than 180 Degrees, and then you muſt ſail to the Eaſtward.

But if you are to go from a greater Weſt Longitude to a leſs, or from a leſs Eaſt Longitude to a greater, or from Weſt Longitude into Eaſt, you muſt ſail to the Eaſtward, except your Difference of Longitude be more than 180 Degrees, and then you muſt ſail to the Weſtward.

EXAMPLE.

In the foregoing Caſe of Mercator's Sailing, I find by the two Latitudes, that I am bound from a greater North Latitude to a leſs, *viz.* from 50.00 N. to 17.10 N. then by the Rule I muſt ſail to the Southward; and I find by the two Longitudes that I am bound from a leſs Weſt Longitude to a greater, *viz.* from 3.10 Weſt to 59.11 Weſt; then by that Rule I am to go to the Weſtward, therefore my Courſe will be South 54.00 Weſt, or SW. three Quarters Weſt neareſt.

This firſt Caſe of Mercator, being the Caſe that is always made Uſe of to find the Courſe and Diſtance from Place to Place, or to find the Bearing and Diſtance of any Place from the Ship at any Time, I have ſet down the Work of it at large, and ſhall leave the other Caſe for the Reader to exerciſe himſelf with, by working them by the Rules already given him.

A Table of the Angles which every Point and Quarter Point of the Compaſs makes with the Meridian.

	D	M		D	M		D	M		D	M
¼	2	49	2¼	25	19	4¼	47	49	6¼	70	19
½	5	37	2½	28	07	4½	50	38	6½	73	07
¾	8	20	2¾	30	56	4¾	53	26	6¾	75	56
1	11	15	3	33	45	5	56	15	7	78	45
1¼	14	04	3¼	36	34	5¼	59	04	7¼	81	34
1½	16	52	3½	39	22	5½	61	53	7½	84	23
1¾	19	41	3¾	42	11	5¾	64	41	7¾	87	11
2	22	30	4	45	00	6	67	30	8	90	00

The Uſe of this Table is to turn Points into Degrees, or Degrees into Points, as follows: Suppoſe I would know how many Degrees 5 Points are, then I look for 5 Points, and againſt it I find 56 Deg. 15 Min. Or if I would know how many Points 42 Deg. 17 Min. are, I look for the neareſt to it, which is 42 Deg 11 Min. and againſt that ſtands 3¾ Points.

Th

The Courſes and Diſtances being ſet down in a Traverſe Table, as in Page (52) it will be found neceſſary for the ready looking them out in the Table of Difference of Latitude and Departure, to know what Angles they make with the Meridian, (or as we commonly ſay) to know how many Points there are, for which Reaſon I have here given the Figure of the Mariner's Compaſs, which is to be uſed as follows.

Example 1ſt. Suppoſe I would know how many Points I muſt look out for in the Tables of Difference of Latitude and Departure, for a SW. by W. Courſe.

Look in the Figure below, and againſt the Point mark'd with S.W. by W. you will ſee the Figure 5, which ſhews that you muſt look out for 5 Points.

Example 2d. How many Points is E. by N. $\frac{3}{4}$ E. againſt E. by N. I find 7, and my Courſe being $\frac{3}{4}$ Points more, it makes 7 $\frac{3}{4}$.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	De
1	01.0	00.0	51	50.9	02.5	101	100.9	05.0	151	150 8	07.4	201	200.8	09.9	251	250.7	12.3
2	02.0	00.1	52	51.9	02.6	02	101.9	05.0	52	151.8	07.5	02	201.8	09.9	52	251.7	12.4
3	03.0	00.1	53	52.9	02.6	03	102.9	05.1	53	152.8	07.5	03	202.8	10.0	53	252.7	12.4
4	04.0	00.2	54	53.9	02.7	04	103.9	05.1	54	153.8	07.6	04	203.8	10.0	54	253.7	12.5
5	05.0	00.2	55	54.9	02.7	05	104.9	05.2	55	154.8	07.6	05	204.8	10.1	55	254.7	12.5
6	06.0	00.3	56	55.9	02.7	106	105.9	05.2	156	155.8	07.7	206	205.8	10.1	256	255.7	12.6
7	07.0	00.3	57	56.9	02.8	07	106.9	05.3	57	156.8	07.7	07	206.8	10.2	57	256.7	12.6
8	08.0	00.4	58	57.9	02.8	08	107.9	05.3	58	157.8	07.8	08	207.8	10.2	58	257.7	12.7
9	09.0	00.4	59	58.9	02.9	09	108.9	05.4	59	158.8	07.8	09	208.7	10.3	59	258.7	12.7
10	10.0	00.5	60	59.9	02.9	10	109.9	05.4	60	159.8	07.9	10	209.7	10.3	60	259.7	12.8
11	11.0	00.5	61	60.9	03.0	111	110.9	05.5	161	160.8	07.9	211	210.7	10.4	261	260.7	12.8
12	12.0	00.6	62	61.9	03.0	12	111.9	05.5	62	161.8	08.0	12	211.7	10.4	62	261.7	12.9
13	13.0	00.6	63	62.9	23.1	13	112.9	05.5	63	162.8	08.0	13	212.7	10.5	63	262.7	12.9
14	14.0	00.7	64	63.9	03.1	14	113.9	05.6	64	163.8	08.1	14	213.7	10.5	64	263.7	13.0
15	15.0	00.7	65	64.9	03.2	15	114.9	05.6	65	164.8	08.1	15	214.7	10.6	65	264.7	13.0
16	16.0	00.8	66	65.9	03.2	116	115.9	05.7	166	165.8	08.2	216	215.7	10.6	266	265.7	13.1
17	17.0	00.8	67	66.9	03.3	17	116.9	05.7	67	166.8	08.2	17	216.7	10.7	67	266.7	13.1
18	18.0	00.9	68	67.9	03.3	18	117.9	05.8	68	167.8	08.3	18	217.7	10.7	68	267.7	13.2
19	19.0	00.9	69	68.9	03.4	19	118.9	05.8	69	168.8	08.3	19	218.7	10.8	69	268.7	13.2
20	20.0	01.0	70	69.9	03.4	20	119.9	05.9	70	169.8	08.4	20	219.7	10.8	70	269.7	13.3
21	21.0	01.0	71	70.9	03.5	121	120.9	05.9	171	170.8	08.4	121	220.7	10.9	271	270.7	15.3
22	22.0	01.1	72	71.9	03.5	22	121.9	06.0	72	171.8	08.5	22	221.7	10.9	72	271.7	15.4
23	23.0	01.1	73	72.9	03.6	23	122.9	06.0	73	172.8	08.5	23	222.7	11.0	73	272.7	15.4
24	24.0	01.2	74	73.9	03.6	24	123.9	06.1	74	173.8	08.5	24	223.7	11.0	74	273.7	15.5
25	25.0	01.2	75	74.9	03.7	25	124.9	06.1	75	174.8	08.6	25	224.7	11.1	75	274.7	15.5
26	26.0	01.3	76	75.9	03.7	126	125.8	06.2	176	175.8	08.6	226	225.7	11.1	276	275.7	13.6
27	27.0	01.3	77	76.9	03.8	27	126.8	06.2	77	176.8	08.7	27	226.7	11.2	77	276.7	13.6
28	28.0	01.4	78	77.9	03.8	28	127.8	06.3	78	177.8	08.7	28	227.7	11.2	78	277.7	13.7
29	29.0	01.4	79	78.9	03.9	29	128.8	06.3	79	178.8	08.8	29	228.7	11.3	79	278.7	13.7
30	30.0	01.5	80	79.9	03.9	30	129.8	06.4	80	179.8	08.8	30	229.7	11.3	80	279.7	13.8
31	31.0	01.5	81	80.9	04.0	131	130.8	06.4	181	180.8	08.9	231	230.7	11.4	281	280.7	13.8
32	32.0	01.6	82	81.9	04.0	32	131.8	06.5	82	181.8	08.9	32	231.7	11.4	82	281.7	13.9
33	33.0	01.6	83	82.9	04.1	33	132.8	06.5	83	182.8	09.0	33	232.7	11.5	83	282.7	13.9
34	34.0	01.7	84	83.9	04.1	34	133.8	06.6	84	183.8	09.0	34	233.7	11.5	84	283.7	14.0
35	35.0	01.7	85	84.9	04.2	35	134.8	06.6	85	184.8	09.1	35	234.7	11.5	85	284.7	14.0
36	36.0	01.8	86	85.9	04.2	136	135.8	06.7	186	185.8	09.1	236	235.7	11.6	286	285.7	14.1
37	37.0	01.8	87	86.9	04.3	37	136.8	06.7	87	186.8	09.2	37	236.7	11.6	87	286.7	14.1
38	38.0	01.9	88	87.9	04.3	38	137.8	06.8	88	187.8	09.2	38	237.7	11.7	88	287.7	14.2
39	39.0	01.9	89	88.9	04.4	39	138.8	06.8	89	188.8	09.3	39	238.7	11.7	89	288.7	14.2
40	40.0	02.0	90	89.9	04.4	40	139.8	06.9	90	189.8	09.3	40	239.7	11.8	90	289.7	14.3
41	41.0	02.0	91	90.9	04.5	141	140.8	06.9	191	190.8	09 4	241	240.7	11.8	291	290.7	14.3
42	41.9	02.1	92	91.9	04.5	42	141.8	07.0	92	191.8	09.4	42	241.7	11.9	92	291.6	14.4
43	42.9	02.1	93	92.9	04.6	43	142.8	07.0	93	192.8	09.5	43	242.7	11.9	93	292.6	14.4
44	43.9	02.2	94	93.9	04.6	44	143.8	07.1	94	193.8	09.5	44	243.7	12.0	94	293.6	14.5
45	44.9	02.2	95	94.9	04.7	45	144.8	07.1	95	194.8	09.6	45	244.7	12.0	95	294.6	14.5
46	45.9	02.3	96	95.9	04.7	146	145.8	07.2	196	195.8	09.6	246	245.7	12.1	296	295.6	14.5
47	46.9	02.3	97	96.9	04.8	47	146.8	07.2	97	196.8	09.7	47	246.7	12.1	97	296.6	14.6
48	47.9	02.4	98	97.9	04.8	48	147.8	07.3	98	197.8	09.7	48	247.7	12.2	98	297.6	14.6
49	48.9	02.4	99	98.9	04.9	49	148.8	07.3	99	198.8	09.8	49	248.7	12.2	99	298.6	14.7
50	49.9	02.5	100	99.9	04.9	150	149.8	07.4	200	199.8	09.8	250	249.7	12.3	300	299.6	14.7
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

Difference of Latitude and Departure for ½ Point.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	01.0	00.1	51	50.8	05.0	101	100.5	09.9	151	150.3	14.8	201	200.0	19.7	251	249.8	24.6
2	02.0	00.2	52	51.8	05.1	02	101.5	10.0	52	151.3	14.9	02	201.0	19.8	52	250.8	24.7
3	03.0	00.3	53	52.7	05.2	03	102.5	10.1	53	152.3	15.0	03	202.0	19.9	53	251.8	24.8
4	04.0	00.4	54	53.7	05.3	04	103.5	10.2	54	153.3	15.1	04	203.0	20.0	54	252.8	24.9
5	05.0	00.5	55	54.7	05.4	05	104.5	10.3	55	154.3	15.2	05	204,0	20.1	55	253.8	25.0
6	06.0	00.6	56	55.7	05.5	106	105.5	10.4	156	155.3	15.3	206	205.0	20.2	256	254.8	25.1
7	07.0	00.7	57	56.7	05.6	07	106.5	10.5	57	156.2	15.4	07	206.0	20.2	57	255.8	25.2
8	08.0	00.8	58	57.7	05.7	08	107.5	10.6	58	157.2	15.5	08	207.0	20.3	58	256.8	25.3
9	09.0	00.9	59	58.7	05.8	09	108.5	10.7	59	158.2	15.6	09	208.0	20.4	59	257.8	25.4
10	10.0	01.0	60	59.7	05.9	10	109.5	10.8	60	159.2	15.7	10	209.0	20.5	60	258.8	25.5
11	10.9	01.1	61	60.7	06.0	111	110.5	10.9	161	160.2	15.7	211	210.0	20.6	261	259.7	25.6
12	11.9	01.2	62	61.7	06.1	12	111.5	11.0	62	161.2	15.8	12	211.0	20.7	62	260.7	25.7
13	12.9	01.3	63	62.7	06.2	13	112.5	11.1	63	162.2	15.9	13	212.0	20.8	63	261.7	25.8
14	13.9	01.4	64	63.7	06.3	14	113.5	11.2	64	163.2	16.0	14	213.0	20.9	64	262.7	25.9
15	14.9	01.5	65	64.7	06.4	15	114.4	11.2	65	164.2	16.1	15	214.0	21.0	65	263.7	26.0
16	15.9	01.6	66	65.7	06.5	116	115.4	11.3	166	165.2	16.2	216	215.0	21.1	266	264.7	26.1
17	16.9	01.7	67	66.7	06.6	17	116.4	11.4	67	166.2	16.3	17	216.0	21.2	67	265.7	26.2
18	17.9	01.8	68	67.7	06.7	18	117.4	11.5	68	167.2	16.4	18	217.0	21.3	68	266.7	26.3
19	18.9	01.9	69	68.7	06.7	19	118.4	11.6	69	168.2	16.5	19	217.9	21.4	69	267.7	26.4
20	19.9	02.0	70	69.7	06.8	20	119.4	11.7	70	169.2	16.6	20	218.9	21.5	70	268.7	26.5
21	20.9	02.1	71	70.7	06.9	121	120.4	11.8	171	170.2	16.7	221	219.9	21.6	271	269.7	26.6
22	21.6	02.2	72	71.7	07.0	22	121.4	11.9	72	171.2	16.8	22	120.9	21.7	72	270.7	26.7
23	22.9	02.2	73	72.6	07.1	23	122.4	12.0	73	172.2	16.9	23	221.9	21.8	73	271.7	26.8
24	23.9	02.3	74	73.6	07.2	24	123.4	12.1	74	173.2	17.0	24	222.9	22.9	74	272.7	26.9
25	24.9	02.4	75	74.6	07.3	25	124.4	12.2	75	174.2	17.1	25	223.9	22.0	75	273.7	27.0
26	25.9	02.5	76	75.6	07.4	126	125.4	12.3	176	175.2	17.2	226	224.9	22.1	276	274.7	27.1
27	26.9	02.6	77	76.6	07.5	27	126.4	12.4	77	176.2	17.3	27	225,9	22.2	77	275.7	27.2
28	27.9	02.7	78	77.6	07.6	28	127.4	12.5	78	177.1	17.4	28	226.9	22.3	78	276.7	27.3
29	28.9	02.8	79	78.6	07.7	29	128.4	12.6	79	178.1	17.5	29	227.9	22.4	79	277.7	27.4
30	29.9	02.9	80	79.6	07.8	30	129.4	12.7	80	179.1	17.6	30	228.9	22.5	80	278.7	27.5
31	30.9	03.0	81	80.6	07.9	131	130.4	12.8	181	180.1	17.7	231	229.9	22.6	281	279.6	27.6
32	31.8	03.1	82	81.6	08.0	32	131.4	12.9	82	181.1	17.8	32	230.9	22.7	82	280.6	27.7
33	32.8	03.2	83	82.6	08.1	33	132.4	13.0	83	182.1	17.9	33	231.9	22.8	83	281.6	27.8
34	33.8	03.3	84	83.6	08.2	34	133.4	13.1	84	183.1	18.0	34	232.9	22.9	84	282.6	27.9
35	34.8	03.4	85	84.6	08.3	35	134.4	13.2	85	184.1	18.1	35	233 9	22.0	85	283.6	28.0
36	35.8	03.5	86	85.6	08.4	136	135.3	13.3	186	185.1	18,2	236	234.9	23.1	286	284.6	28.1
37	36.8	03.6	87	86.6	08.5	37	136.3	13.4	87	186.1	18.3	37	235.9	23.2	87	285.6	28,2
38	37.8	03.7	88	87.6	08.6	38	137.3	13.5	88	187.1	18.4	38	236.9	23.3	88	286.6	28.3
39	38.8	03.8	89	88.6	08.7	39	138.3	13.6	89	188.1	18.5	39	237.9	23.4	89	287.6	28.4
40	39.8	03.9	90	89.6	08.8	40	139.3	13.7	90	189.1	18.6	40	238.9	23.5	90	288.6	28.5
41	40.8	04.0	91	90.6	08.9	141	140.3	13.8	191	190.1	18.7	241	239.8	23.6	291	289.6	28.6
42	41.8	04.1	92	91.6	09.0	42	141.3	13.9	92	191.1	18.8	42	240.8	23.7	92	290.6	28.7
43	42.8	04.2	93	92.6	09.1	43	142.3	14.0	93	192.1	18.9	43	241.8	23.8	93	291.6	28.8
44	43.8	04.3	94	93.5	09.2	44	143.3	14.1	94	193.1	19.0	44	242.8	23.9	94	292.6	28.9
45	44.8	04.4	95	94.5	09.3	45	144.3	14.2	95	194.1	19.1	45	243.8	24.0	95	293.6	29.0
46	45.8	04.5	96	95.5	09.4	146	145.3	14.3	196	195.1	19.2	246	244.8	24.1	296	294.6	29.1
47	46.8	04.6	97	96.5	09.5	47	146.3	14.4	97	196.1	19.3	47	245.8	24.2	97	295.6	29.2
48	47.8	04.7	98	97.5	09.6	48	147.3	14.5	98	197.0	19.4	48	246,8	24.3	98	296.6	29.2
49	48.8	04.8	99	98.5	09,7	49	148.3	14.6	99	198.0	19.5	49	247.8	24.4	99	297.6	29.3
50	49.8	04.9	100	99.5	09.8	150	149.3	14.7	200	199.0	19.6	250	248.8	24.5	300	298.6	29.4
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

for 7½ Points.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	De
1	01.0	00.1	51	50.4	07.5	101	99.9	14.8	151	149.4	22.1	201	198.8	29.5	251	248.3	36.8
2	02.0	00.3	52	51.4	07.6	02	100.9	15.0	52	150 3	22.3	02	199.8	29.6	52	249.3	37.0
3	03.0	00.4	53	52.4	07.8	03	101.9	15.1	53	151.3	22.4	03	200.8	29.8	53	250.2	37.1
4	04.0	00.6	54	53.4	07.9	04	102.9	15.3	54	152.3	22.6	04	201.8	29.9	54	251.2	37.3
5	04.9	00.7	55	54.4	08.1	05	103.9	15.4	55	153.3	22.7	05	202.8	30.1	55	252.2	37.4
6	05.9	00.9	56	55.4	08.2	106	104.8	15.5	156	154.3	23.9	206	203.8	30.2	256	253.2	37.5
7	06.9	01.0	57	56.4	08.4	07	105.8	15.7	57	155.3	23.0	07	204.7	30.4	57	254.2	37.7
8	07.9	01.2	58	57.4	08.5	08	106.8	15.8	58	156.3	23.2	08	205.7	30.5	58	255.2	37.8
9	08.9	01.3	59	58.4	08.6	09	107.8	16.0	59	157.3	23.3	09	206.7	30.6	59	256.2	38.0
10	09.9	01.5	60	59.3	08.8	10	108.8	16.1	60	158.3	23.5	10	207.7	30.8	60	257.2	38.1
11	10.9	01.6	61	60.3	08.9	111	109.8	16.3	161	159.2	23.6	211	208.7	30.9	261	258.2	38.3
12	11.9	01.8	62	61.3	09.1	12	110.8	16.4	62	160.2	23.8	12	209.7	31.1	62	259.1	38.4
13	12.9	01.9	63	62.3	09.2	13	111.8	16.6	63	161.2	23.9	13	210.7	31.2	63	260.1	38.6
14	13.8	02.1	64	63.3	09.4	14	112.8	16.7	64	162.2	24.0	14	211.7	31.4	64	261.1	38.7
15	14.8	02.2	65	64.3	09.5	15	113.7	16.9	65	163.2	24.2	15	212.7	31.5	65	262.1	38.9
16	15.8	02.3	66	65.3	09.7	116	114.7	17.0	166	164.2	24.3	216	213.7	31.7	266	263.1	39.0
17	16.8	02.5	67	66.3	09.8	17	115.7	17.2	67	165.2	24.5	17	214.6	31.8	67	264.1	39.2
18	17.8	02.6	68	67.3	10.0	18	116.7	17.3	68	166.2	24.6	18	215.6	32.0	68	265.1	39.3
19	18.8	02.8	69	68.2	10.1	19	117.7	17.5	69	167.2	24.8	19	216.6	32.1	69	266.1	39.5
20	19.8	02.9	70	69.2	10.3	20	118.7	17.6	70	168.1	24.9	20	217.6	32.3	70	267.1	39.6
21	20.8	03.1	71	70.2	10.4	121	119.7	17.7	171	169.1	25.1	121	218.6	32.4	271	268.1	39.7
22	21.8	03.2	72	71.2	10.6	22	120.7	17.9	72	170.1	25.2	22	219.6	32.6	72	269.0	39.9
23	22.7	03.4	73	72.2	10.7	23	121.7	18.0	73	171.1	25.4	23	220.6	32.7	73	270.0	40.0
24	23.7	03.5	74	73.2	10.8	24	122.7	18.2	74	172.1	25.5	24	221.6	32.8	74	271.0	40.2
25	24.7	03.7	75	74.2	11.0	25	123.6	18.3	75	173.1	25.7	25	222.6	33.0	75	272.0	40.3
26	25.7	03.8	76	75.2	11.1	126	124.6	18.5	176	174.1	25.8	226	223.5	33.1	276	273.0	40.5
27	26.7	04.0	77	76.2	11.3	27	125.6	18.6	77	175.1	26.0	27	224.5	33.3	77	274.0	40.6
28	27.7	04.1	78	77.1	11.4	28	126.6	18.8	78	176.1	26.1	28	225.5	33.4	78	275.0	40.8
29	28.7	04.3	79	78.1	11.6	29	127.6	18.9	79	177.1	26.3	29	226.5	33.6	79	276,0	40.9
30	29.7	04.4	80	79.1	11.7	30	128.6	19.1	80	178.0	26.4	30	227.5	33.7	80	277.0	41.1
31	30.7	04.5	81	80.1	11.9	131	129.6	19.2	181	179.0	26.5	231	228.5	33.9	281	277.9	41.2
32	31.7	04.7	82	81.1	12.0	32	130.6	19.4	82	180.0	26.7	32	229.5	34.0	82	278.9	41.4
33	32.6	04.8	83	82.1	12.2	33	131.6	19.5	83	181.0	26.8	33	230.5	34.2	83	279 9	41.5
34	33.6	05.0	84	83.1	12.3	34	132.5	19.6	84	182.0	27.0	34	231.5	34.3	84	280.9	41.6
35	34.6	05.1	85	84.1	12.5	35	133.5	19.8	85	183.0	27.1	35	232.4	34.5	85	281.9	41.8
36	35.6	05.3	86	85.1	12.6	136	134.5	19.9	186	184.0	27.3	236	233.4	34.6	286	282.9	41.9
37	36.6	05.4	87	86.1	12.8	37	135.5	20.1	87	185.0	27.4	37	234.4	34.8	87	283.9	42.1
38	37.6	05.6	88	87.0	12.9	38	136.5	20.2	88	186.0	27.6	38	235.4	34.9	88	284.9	42.2
39	38.6	05.7	89	88.0	13.0	39	137.5	20.4	89	186.9	27.7	39	236.4	35.0	89	285.9	42.4
40	39.6	05.9	90	89.0	13.2	40	138.5	20.5	90	187.9	27.9	40	237.4	35.2	90	286.8	42.5
41	40.6	06.0	91	90.0	13.3	141	139.5	20.7	191	188.9	28.0	241	238.4	35.3	291	287.8	42.7
42	41.5	06.2	92	91.0	13.5	42	140.5	20.8	92	189.9	28.2	42	239.4	35.5	92	288.8	42.8
43	42.5	06.3	93	92.0	13.6	43	141.4	21.0	93	190.9	28.3	43	240.4	35.6	93	289.8	43.0
44	43.5	06.5	94	93.0	13.8	44	142.4	21.1	94	191.9	28.5	44	241.3	35.8	94	290.8	43.1
45	44.5	06.6	95	94.0	13.9	45	143.4	21.3	95	192.9	28.6	45	242.3	35.9	95	291.8	43.3
46	45.5	06.7	96	95.0	14.1	146	144.4	21.4	196	193.9	28.7	246	243.3	36.1	296	292.8	43.4
47	46.5	06.9	97	95.9	14.2	47	145.4	21.6	97	194.9	28.9	47	244.3	36.2	97	293.8	43.6
48	47.5	07.0	98	96.9	14.4	48	146.4	21.7	98	195.8	29.0	48	245.3	36.4	98	294.8	43.7
49	48.5	07.2	99	97.9	14.5	49	147.4	21.8	99	196.8	29.2	49	246.3	36.5	99	295.7	43.8
50	49.5	07.3	100	98.9	14.7	150	148.4	22.0	200	197.8	29.3	250	247.3	36.7	300	296.7	44.0
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Lat	Dep	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	01.0	00.2	51	50.0	10.0	101	99.1	19.7	151	148.1	29.5	201	197.1	39.2	251	246,1	49.0
2	02.0	00.4	52	51.0	10.1	02	100.0	19.9	52	149.1	29.7	02	198.1	39.4	52	247.1	49.2
3	02.9	00.6	53	52.0	10.3	03	101.0	20.1	53	150.0	29.9	03	199.1	39.6	53	248.1	49.4
4	03.9	00.8	54	53.0	10.5	04	102.0	20.3	54	151.0	30.0	04	200.1	39.8	54	249.1	49.6
5	04.9	01.0	55	53.9	10.7	05	103.0	20.5	55	152.0	30.2	05	201.0	40.0	55	250.1	49.8
6	05.9	01.2	56	54.9	10.9	106	104.0	20.7	156	153.0	30.4	206	202.0	40.2	256	251.1	50.0
7	06.9	01.4	57	55.9	11.1	07	104.9	20.9	57	154.0	30.6	07	203.0	40.4	57	252.0	50.1
8	07.8	01.6	58	56.9	11.3	08	105.9	21.1	58	154.9	30.8	08	204,0	40.6	58	253.0	50,3
9	08.8	01.8	59	57.9	11.5	09	106.9	21.3	59	155.9	31.0	09	205.0	40.8	59	254.0	50.5
10	09.8	02.0	60	58.8	11.7	10	107.9	21.5	60	156.9	31.2	10	205.9	41.0	60	255.0	50.7
11	10.8	02.1	61	59.8	11.9	111	108.9	21.7	161	157.9	31.4	211	206.9	41.2	261	256.0	50.9
12	11.8	02.3	62	60.8	12.1	12	109.8	21.9	62	158.9	31.6	12	207.9	41.4	62	256.9	51.1
13	12 7	02.5	63	61.8	12.3	13	110.8	22.0	63	159.8	31.8	13	208.9	41.6	63	257.9	51.3
14	13.7	02.7	64	62.8	12.5	14	111.8	22.2	64	160.8	32.0	14	209.9	41.8	64	258.9	51.5
15	14.7	02.9	65	63.7	12.7	15	112.8	22.4	65	161.8	32.2	15	210.8	42.0	65	259.9	51.7
16	15.7	03.1	66	64.7	12 9	116	113.8	22.6	166	162.8	32.4	216	211.8	42.1	266	260.9	51.9
17	16.7	03.3	67	65.7	13.1	17	114.7	22.8	67	163.8	32.6	17	212.8	42.3	67	261.8	52.1
18	17.7	03.5	68	66.7	13.3	18	115.7	23.0	68	164.7	32.8	18	213.8	42.5	68	262.8	52.3
19	18.6	03.7	69	67.7	12.5	19	116.7	23.2	69	165.7	33.0	19	214.8	42.7	69	263.8	52.5
20	19.6	03.9	70	68.6	13.7	20	117.7	23.4	70	166.7	33.2	20	215.7	42.9	70	264.8	52.7
21	20.6	04.1	71	69.6	13.9	121	118.7	23.6	171	167.7	33.4	221	216.7	43.1	271	265.8	52.9
22	21.6	04.3	72	70.6	14.0	22	119.6	23.8	72	168.7	33.6	22	217.7	43.3	72	266.7	53.1
23	22.6	04.5	73	71.6	14.2	23	120.6	24.0	73	169.7	33.8	23	218.7	43.5	73	267.7	53.3
24	23.5	04.7	74	72.6	14.4	24	121.6	24.2	74	170.6	34.0	24	219.7	43.7	74	268.7	53.5
25	24.5	04.9	75	73.6	14.6	25	122.6	24.4	75	171.6	34.1	25	220.6	43.9	75	269.7	53.7
26	25.5	05.1	76	74.5	14.8	126	123.6	24.6	176	172.6	34.3	226	221.6	44.1	276	270.7	53.9
27	26.5	05.3	77	75.5	15.0	27	124.5	24.8	77	173.6	34.5	27	222.6	44.3	77	271.6	54.0
28	27.5	05.5	78	76.5	15.2	28	125.5	25.0	78	174.6	34.7	28	223.6	44.5	78	272.6	54.4
29	28.4	05.7	79	77.5	15.4	29	126.5	25.2	79	175.5	34.9	29	224.6	44.7	79	273.6	54.2
30	29.4	05.9	80	78.5	15.6	30	127.5	25.4	80	176.5	35.1	30	225.6	44.9	80	274.6	54.6
31	30.4	06.0	81	79.4	15.8	131	128.5	25.6	181	177.5	35.3	231	226.5	45.1	281	275.6	54.8
32	31.4	06.2	82	80.4	16.0	32	129.5	25.8	82	178.5	35.5	32	227.5	45.3	82	276.5	55.0
33	32.4	06.4	83	81.4	16.2	33	130.4	26.0	83	179.5	35.7	33	228.5	45.5	83	277.5	55.4
34	33.3	06.6	84	82.4	16.4	34	131.4	26.1	84	180.4	35.9	34	229.5	45.7	84	278.5	55.2
35	34.3	06.8	85	83.4	16.6	35	132.4	26.3	85	181.4	36.1	35	230.5	45.9	85	279.5	55.6
36	35.3	07.0	86	84.3	16.8	136	133.4	26.5	186	182.4	36,3	236	231.4	46.0	286	280.5	55.8
37	36.3	07.2	87	85.3	17.0	37	134.4	26.7	87	183.4	36.5	37	232.4	46.2	87	281.5	56,0
38	37.3	07.4	88	86.3	17.2	38	135.3	26.9	88	184.4	36.7	38	233.4	46.4	88	282.4	56.2
39	38.2	07.6	89	87.3	17.4	39	136.3	27.1	89	185.3	36.9	39	234.4	46.6	89	283.4	56.4
40	39.2	07.8	90	88.3	17.6	40	137.3	27.3	90	186.3	37.1	40	235.4	46.8	90	284.4	56.6
41	40.2	08.0	91	89.2	17.8	141	138.3	27.5	191	187.3	37.3	241	236.3	47.0	291	285.4	56.8
42	41.2	08.2	92	90.2	18.0	42	139.3	27.7	92	188.3	37.5	42	237.3	47.2	92	286.4	57.0
43	42.2	08.4	93	91.2	18.1	43	140.2	27.9	93	189.3	37.7	43	238.3	47.4	93	287.3	57.2
44	43.2	08.6	94	92.2	18.3	44	141.2	28.1	94	190.2	37.9	44	239.3	47.6	94	288.3	57.4
45	44.1	08.8	95	93.2	18.5	45	142.2	28.3	95	191.2	38.0	45	240.3	47.8	95	289.3	57.6
46	45.1	09.0	96	94.1	18.7	146	143.2	28.5	196	192.2	38.2	246	241.2	48.0	296	290.3	57.8
47	46.1	09.2	97	95.1	19.9	47	144.2	28.7	97	193.2	38.4	47	242.2	48.2	97	291.3	58.0
48	47.1	09.4	98	96.1	19,1	48	145.1	28.9	98	194.2	38.6	48	243.2	48.4	98	292.2	58.1
49	48.1	09.6	99	97.1	19.3	49	146.1	29.1	99	195.2	38.8	49	244.2	48.6	99	293.2	58.3
50	49.0	09.8	100	98.1	19.5	150	147.1	29.3	200	196.1	39.0	250	245.2	48.8	300	294.2	38.5
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

D ft	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	01.0	00.2	51	49.5	12.4	101	98.0	24.5	151	146.5	36.7	201	195,0	48.8	251	243.5	61.0
2	01.9	00.5	52	50.4	12.6	02	98.9	24.8	52	147.4	36.9	02	195.9	49.1	52	244.4	61.2
3	02.9	00.7	53	51.4	12.9	03	99,9	25.0	53	148.4	37.2	03	196.9	49.3	53	245.4	61.5
4	03.9	01.0	54	52.4	13.1	04	100.9	25.3	54	149.4	37.4	04	197.9	49.6	54	246.4	61.7
5	04.9	01.2	55	53.4	13.4	05	101.9	25.5	55	150.4	37.7	05	198.9	49.8	55	247.4	62.0
6	05.8	01.5	56	54.3	13.6	106	102.8	25.8	156	151.3	37.9	206	199.8	50.1	256	248.3	62.2
7	06.8	01.7	57	55.3	13.9	07	103.8	26.0	57	152.3	38.2	07	200.8	50.3	57	249.3	62.5
8	07.8	01.9	58	56.3	14.1	08	104.8	26.2	58	153.3	38.4	08	201.8	50.5	58	250.3	62.7
9	08.7	02.2	59	57.2	14.3	09	105.7	26.5	59	154.2	38.6	09	202.7	50.8	59	251.2	62.9
10	09.7	02.4	60	58.2	14.6	10	106.7	26.7	60	155.2	38.9	10	203.7	51.0	60	252.2	63.2
11	10.7	02,7	61	59.2	14.8	111	107.7	27.0	161	156.2	39.1	211	194.7	51.3	261	253.2	63.4
12	11.6	02.9	62	60.1	15.1	12	108.6	27.2	62	157.1	39.4	12	105.6	51.5	62	254.1	63.7
13	12.6	03.2	63	61.1	15.3	13	109.6	27.5	63	158.1	39.6	13	206.6	51.8	63	255.1	63.9
14	13.6	03.4	64	62.1	15.6	14	110.6	27.7	64	159.1	39.9	14	207.6	52.0	64	256.1	64.2
15	14.6	03.6	65	63.1	15.8	15	111.6	27.9	65	160.1	40.1	15	208.6	52.2	65	257.1	64.4
16	15.5	03.9	66	64.0	16.0	116	112.5	28,2	166	161.0	40.3	216	209.5	52.5	266	258.0	64.6
17	16.5	04.1	67	65.0	16.3	17	113.5	28.4	67	162.0	40.6	17	210.5	52.7	67	259.0	64.9
18	17.5	04.4	68	66.0	16,5	18	114.5	28.7	68	163.0	40.8	18	211.5	53.0	68	260.0	63.1
19	18.4	04.6	69	66.9	16.8	19	115.4	28.9	69	163.9	41.1	19	212.4	53.2	69	260.9	65.4
20	19.4	04.9	70	67.9	17.0	20	116.4	29.2	70	164.9	41.3	20	213.4	53.5	70	261.9	65.6
21	20.4	05.1	71	68.9	17.3	121	117.4	29.4	171	165.9	41.6	221	214.4	53.7	271	262.9	65.9
22	21.3	05.3	72	69.8	17.5	22	118.3	29.6	72	166.8	41.8	22	215.3	53.9	72	263.8	66.1
23	22.3	05.6	73	70.8	17.7	23	119.3	29.9	73	167.8	42.0	23	216.3	54.2	73	264.8	66.3
24	23.3	05.8	74	71.8	18.0	24	120.3	30.1	74	168.8	42.3	24	217.3	54.4	74	265.8	66.6
25	24.3	06.1	75	72.8	18.2	25	121.3	30.4	75	169.8	42.5	25	218.3	54.7	75	266.8	66.8
26	25.2	06.3	76	73.7	18.5	126	122.2	30.6	176	170.7	42.8	226	219.2	54.9	276	267.7	67.1
27	26.2	06.6	77	74.7	18.7	27	123.2	30.9	77	171.7	43.0	27	220.2	55.2	77	268.7	67.3
28	27.2	06.8	78	75.7	19.0	28	124.2	31.1	78	172.7	43.3	28	221.2	55.4	78	269.7	67.6
29	28.1	07.0	79	76.6	19.2	29	125.1	31.3	79	173.6	43.5	29	222.1	55.6	79	270.6	67.8
30	29.1	07.3	80	77.6	19.4	30	126.1	31.6	80	174.6	43.7	30	223.1	55.9	80	271.6	68.0
31	30.1	07.5	81	78.6	19.7	131	127.1	31.8	181	175.6	44,0	231	224.1	56.1	281	272.6	68.3
32	31.0	07.8	82	79.5	19.9	32	128.0	32.1	82	176.5	44.2	32	225.0	56.4	82	273.5	68.5
33	32.0	08.0	83	80.5	20.2	33	129.0	32,3	83	177,5	44.5	33	226.0	56.6	83	274.5	68.8
34	33.0	08.3	84	81.5	20.4	34	130.0	32.6	84	178.5	44.7	34	227.0	56.9	84	275.5	69.0
35	34.0	08.5	85	82.5	20.7	35	131.0	32.8	85	179.5	45.0	35	228.0	57.1	85	276.5	69.3
36	34.9	08.7	86	83 4	20.9	136	131.9	33.0	186	180.4	45.2	236	228.9	57,3	286	277.4	67.5
37	35.9	09.0	87	84.4	21.1	37	132.9	33.3	87	181.4	45.4	37	229.9	57.6	87	278.4	69.7
38	36.9	09.2	88	85.4	21.4	38	133.9	33.5	88	182.4	45.7	38	230.9	57.8	88	279.4	70,0
39	37.8	09.5	89	86.3	21.6	39	134.8	33.8	89	183.3	45.9	39	231.8	58.1	89	280.3	70.2
40	38.8	09.7	90	87.3	21.9	40	135.8	34.0	90	184.3	46.2	40	232.8	58.3	90	281.3	70.5
41	39.8	10.0	91	88.3	22.1	141	136.8	34.3	191	185.3	46.4	241	233.8	58.6	291	282.3	70.7
42	40.7	10.2	92	86.2	22.4	42	137.7	34.5	92	186.2	46.7	42	234.7	58.8	92	283.2	71.0
43	41.7	10.4	93	90.2	22.6	43	138.7	34.7	93	187.2	46.9	43	235.7	59.0	93	284.2	71.2
44	42.7	10.7	94	91.2	22.8	44	139.7	35.0	94	188.2	47.1	44	236.7	59.3	94	285.2	71.4
45	43.7	10,9	95	92.2	23.1	45	140.7	35.2	95	189.2	47.4	45	237.7	59.5	95	286.2	71.7
46	44.6	11.2	96	93.1	23.3	146	141.6	35.5	196	190.1	47.6	246	238.6	59.8	296	287.1	71.9
47	45.6	11.4	97	94.1	23.6	47	142.6	35.7	97	191.1	47.9	47	239.6	60.0	97	288.1	72.2
48	46.6	11.7	98	95,1	23.8	48	143.6	36.0	98	192.1	48.1	48	240.6	60.3	98	289.1	72.4
49	47.5	11,9	99	96.0	24.1	49	144.5	36.2	99	193.0	48.4	49	241.5	60.5	99	290.0	72.7
50	48.5	12.2	100	97.0	24.3	150	145.5	36.5	200	194.0	48.6	250	242.5	60.7	300	291.0	72.9
D 1	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Dep	Lat

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	01.0	00.3	51	48.8	14.8	101	96.7	29 3	151	144.5	43.8	201	192.4	58.3	251	240.2	72.8
2	01.9	00.6	52	49.8	15.1	02	97.6	29.6	52	145.5	44.1	02	193.3	58.6	52	241.2	73.1
3	02.9	00.9	53	50.7	15.4	03	98.6	29.9	53	146.4	44.4	03	194.3	58.9	53	242.1	73.4
4	03.8	01.2	54	51.7	15.7	04	99.5	30.2	54	147.4	44.7	04	195.2	59,2	54	243.1	73.7
5	04.8	01.5	55	52.6	16.0	05	100.5	30.5	55	148.3	45.0	05	196.2	59.5	55	244.0	74.0
6	05.7	01.7	56	53.6	16.2	106	101.4	30.7	156	149.3	45,2	206	197.1	59.7	256	245.0	74.2
7	06.7	02.0	57	54.5	16.5	07	102.4	31.0	57	150.2	45.5	07	198.1	60.0	57	245.9	74.5
8	07.7	02.3	58	55.5	16.8	08	103.4	31.3	58	151.2	55.8	08	199.1	60.3	58	246.9	74.8
9	08.6	02.6	59	56.5	17.1	09	104.3	31.6	59	152.2	4.61	09	200.0	60.6	59	247.9	75.1
10	09.6	02.9	60	57.4	17.4	10	105.3	31.9	60	153.1	46.4	10	201.0	60.9	60	248.8	75.4
11	10.5	03.2	61	58.4	17.7	111	106.2	32.2	161	154.1	46.7	211	201.9	61.2	261	249.8	75.7
12	11.5	03.5	62	59.3	18.0	12	107.2	32.5	62	155.0	47.0	12	202.9	61.5	62	250.7	76.0
13	12.4	03.8	63	60.3	18.3	13	108.1	32.8	63	156.0	47.3	13	203.8	61,8	63	251.7	76.3
14	13.4	04.1	64	61.2	18.6	14	109.1	33,1	64	156.9	47.6	14	204.8	62.1	64	252.6	76.6
15	14.4	04.4	65	62.2	18.9	15	110.1	33.4	65	157.9	47.9	15	205.8	62.4	65	253.6	76.9
16	15.3	04.6	66	63.2	19.1	116	111.0	33.6	166	158.9	48.1	216	206.7	62.6	266	254.6	77.1
17	16.3	04.9	67	64.1	19 4	17	112.0	33.9	67	159.8	48.4	17	207.7	62.9	67	255.5	77.4
18	17.2	05.2	68	65.1	19.7	18	112.9	34.2	68	160.8	48.7	18	208.6	63,2	68	256.5	77.7
19	18.2	05.5	69	66.0	20.0	19	113,9	34.5	69	161.7	49.0	19	209.6	63.5	69	257.4	78.0
20	19.1	05.8	70	67.0	20.3	20	114.8	34.8	70	162.7	49.3	20	210.5	63.8	70	258.4	78.3
21	20.1	06.1	71	67.9	20.6	121	115.8	35.1	171	163.6	49.6	221	211.5	64.1	271	259.3	78.6
22	21.1	06.4	72	68.9	20.9	22	116,8	55.4	72	164.6	49.9	22	212.5	64.4	72	260.3	78.9
23	22.0	06.7	73	69.9	21.2	23	117.7	35.7	73	165.6	50.2	23	213.4	64.7	73	261.3	79.2
24	23 0	07.0	74	70.8	21.5	24	118.7	36,0	74	166.5	50,5	24	214.4	65.0	74	262.2	79.5
25	23.9	07.3	75	71.8	21.8	25	119.6	36.3	75	167.5	50.8	25	215.3	65.3	75	263.2	79.8
26	24.9	07.5	76	72,7	22.0	126	120.6	36.5	176	168.4	51.0	226	216.3	65.5	276	264.1	80.0
27	25.8	07.8	77	73.7	22.3	27	121.5	36.8	77	169.4	51.3	27	217.2	65.8	77	265.1	80.3
28	26.8	08.1	78	74.6	22.6	28	122.5	37.1	78	170.3	51.6	28	218.2	66.1	78	266.0	80.6
29	27 8	08.4	79	75.6	22.9	29	123.5	37.4	79	171.3	51.9	29	219.2	66.4	79	267.0	80.9
30	28.7	08.7	80	76.6	23.2	30	124.4	37.7	80	172.3	52.2	3⊙	220.1	66.7	80	268.0	81.2
31	29.7	09.0	81	77.5	23.5	131	125.4	38.0	181	173.2	52.5	231	221.1	67.0	281	268.9	81.5
32	30.6	09.3	82	78.5	23.8	32	126.3	38.3	82	174.2	52.8	32	222.0	67.3	82	269.9	81.8
33	31.6	09.6	83	79,4	24.1	33	127.3	38.6	83	175.1	53.1	33	223.0	67.6	83	270.8	82.1
34	32.5	09.9	84	80.4	24.4	34	128.2	38.9	84	176.1	53.4	34	223.9	67.9	84	271.8	82 4
35	33.5	10.2	85	81.3	24.7	35	129.2	39.2	85	177.0	53.7	35	224.9	68.2	85	272.7	82.7
36	34.5	10.4	86	82.3	24.9	136	130.2	39.4	186	178.0	53.9	236	225.9	68.4	286	273.7	82.9
37	35.4	10.7	87	83.3	25,2	37	131.1	39.7	87	179.0	54.2	37	226.8	68.7	87	274.7	83.2
38	36.4	11.0	88	84.2	25.5	38	132.1	40.0	88	179.9	54.5	38	227.8	69.0	88	275.6	83.5
39	37.3	11.3	89	85,2	25.8	39	133.0	40.3	89	180.9	54.8	39	228.7	69.3	89	276.6	83.8
40	38.3	11.6	90	86.1	26,1	40	134.0	40.6	90	181.8	55.1	40	229.7	69.6	90	277.5	84.1
41	39.2	11.9	91	87.1	26.4	141	134,9	40.9	191	182.8	55.4	241	230.6	69.9	291	278.5	84.4
42	40.2	12.2	92	88.0	26.7	42	135.9	41.2	92	183.7	55.7	42	231.6	70.2	92	279.4	84.7
43	41.2	12.5	93	89.0	27.0	43	136.9	41.5	93	184.7	56.0	43	232.5	70.5	93	280.4	85.0
44	42.1	12.8	94	90.0	27.3	44	137.8	41.8	94	185.7	56.3	44	233.5	70.8	94	281.4	85.3
45	43.1	13.1	95	90.9	27.6	45	138.8	42.1	95	186.6	56.6	45	234.5	71.0	95	282.3	85.6
46	44,0	13.3	96	91.9	27.8	146	139.7	42.3	196	187.6	56.8	246	235.4	71.3	296	283.3	85.8
47	45.0	13.6	97	92.8	28.1	47	140.7	42.6	97	188.5	57,1	47	236.4	71.6	97	284.2	86.1
48	45.9	13.9	98	93.8	28.4	48	141.6	42.9	98	189.5	57.4	48	237.3	71.9	98	285.2	86.4
49	46.9	14.2	99	94.7	28.7	49	142.6	43.2	99	190.4	57.7	49	238.3	72.2	99	286.1	86.7
50	47.9	14.5	100	95.7	29.0	50	143.5	43.5	200	191.4	58.0	50	239.2	72.5	300	287.1	87.0
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

for 6½ Points.

Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	00.9	00.3	51	48.0	17.2	101	95,1	34.0	151	142.2	50.9	201	189.2	67.7	251	236.3	84.5
2	01.9	00.7	52	49.0	17.5	02	96.0	34.4	52	143.1	51.2	02	190.2	68.0	52	237.3	84.9
3	02.8	01.0	53	49.9	17.9	03	97.0	34.7	53	144.0	51.5	03	191.1	68.4	53	238.2	85.2
4	03.8	01.3	54	50.8	18.2	04	97.9	35.0	54	145.0	51.9	04	192.1	68.7	54	239.1	85.5
5	04.7	01.7	55	51.8	18.5	05	98.9	35.4	55	145.9	52.2	05	193.0	69.0	55	240.1	85.9
6	05.6	02.0	56	52.7	18.9	106	99,8	35.7	156	146.9	52.5	206	194.0	69.4	256	241.0	86.2
7	06.6	02.4	57	53.7	19.2	07	100.7	36.0	57	147.8	52.9	07	194,9	69.7	57	242.0	86.6
8	07.5	02,7	58	54.6	19.5	08	101.7	36.4	58	148.8	53.2	08	195.8	70.1	58	242.9	86.9
9	08.5	03.0	59	55.5	19.9	09	102.6	36.7	59	149.7	53.6	09	196.8	70.4	59	243.8	87.2
10	09.4	03.4	60	56.5	20.2	10	103.6	37.0	60	150.6	53.9	10	197.7	70.7	60	244.8	87.6
11	10.4	03.7	61	57.4	20.5	111	104.5	37.4	161	151.6	54.2	211	198.7	71.1	261	245.7	87.9
12	11.3	04.0	62	58.4	20.9	12	105.4	37.7	62	152.5	54.6	12	199.6	71.4	62	246.7	88.2
13	12.2	04.4	63	59.3	21.2	13	106.4	38.1	63	153.5	54.9	13	200.5	71.7	63	247.6	88.6
14	13.2	04.7	64	60.3	21.6	14	107.3	38.4	64	154.4	55.2	14	201.5	72.1	64	248.6	88.9
15	14.1	05.1	65	61.2	21.9	15	108.3	38.7	65	155.3	55.6	15	202.4	72.4	65	249.5	89.2
16	15.1	05.4	66	62.1	22.2	116	109.2	39,1	166	156.3	55.9	216	203.4	72.7	266	250.4	89.6
17	16.0	05.7	67	63.1	22.6	17	110.2	39.4	67	157.2	56.2	17	204.3	73.1	67	251.4	89.9
18	17.0	06.1	68	64.0	22.9	18	111.1	39.7	68	158.2	56.6	18	205.2	73.4	68	252.3	90.3
19	17,9	06.4	69	65.0	23.2	19	112.0	40.1	69	159.1	56.9	19	206.2	73.8	69	253.3	90.6
20	18.8	06.7	70	65.9	23.6	20	113.0	40.4	70	160.1	57.3	20	207.1	74.1	70	254.2	90.9
21	19.8	07.1	71	66.8	23.9	121	113.9	40.8	171	161.0	57.6	221	208.1	74.4	271	255.1	91.3
22	20.7	07.4	72	67.8	24.2	22	114.9	41.1	72	161.9	57.9	22	209.0	74.8	72	256.1	91.6
23	21.7	07.7	73	68.7	24.6	23	115.8	41.4	73	162.9	58.3	23	210.0	75.1	73	257.0	91.9
24	22.6	08.1	74	69.7	24.9	24	116.7	41.8	74	163.8	58.6	24	210.9	75.4	74	258.0	92.3
25	23.5	08.4	75	70.6	25,3	25	117.7	42.1	75	164.8	58.9	25	211.8	75.8	75	258.9	92.6
26	24.5	08.8	76	71.1	25.6	126	118.6	42.4	176	165.7	59.3	226	212.8	76.1	276	259.9	93.0
27	25.4	09.1	77	72.5	25.9	27	119.6	42.8	77	166.6	59.6	27	213.7	76.5	77	260.8	93.3
28	26.4	09.4	78	73.4	26,3	28	120.5	43.1	78	167.6	60.0	28	214.7	76.8	78	261.7	93.6
29	27.3	09.8	79	74.4	26.6	29	121.5	43.4	79	168.5	60,3	29	215.6	77.1	79	262.7	94.0
30	28.2	10.1	80	75.3	26.9	30	122.4	43.8	80	169.5	60.6	30	216.5	77.5	80	263.6	94.3
31	29.2	10.4	81	76.3	27.3	131	123.3	44,1	181	170.4	61.0	231	217.5	77.8	281	264.6	94.6
32	30.1	10.8	82	77.2	27.6	32	124.3	44.5	82	171.4	61.3	32	218.4	78.1	82	265.5	95.0
33	31.1	11.1	83	78.1	28.0	33	125.2	44.8	83	172.3	61.6	33	219.4	78.5	83	266.4	95.3
34	32.0	11.5	84	79.1	28.3	34	126.2	45.1	84	173.2	62.0	34	220.3	78.8	84	267.4	95.6
35	33.0	11.8	85	80.0	28.6	35	127.1	45.5	85	174.2	62.3	35	221.3	79.1	85	268.3	96.0
36	33.9	12.1	86	81.0	29.0	136	128.0	45.8	186	175.1	62.6	236	222.2	79.5	286	269.3	96.3
37	34.8	12,5	87	81.9	29.3	37	129.0	46.1	87	176.1	63.0	37	223.1	79.8	87	270.2	96,7
38	35.8	12,8	88	82.9	29.6	38	129.9	46.5	88	177.0	63.3	38	224.1	80.2	88	271.2	97.0
39	36.7	13.1	89	83.8	30.0	39	130.9	46.8	89	177,9	63.7	39	225.0	80.5	89	272.1	97.3
40	37.7	13.5	90	84.7	30.3	40	131.8	47.2	90	178.9	64.0	40	226.0	80.8	90	273.0	97.7
41	38.6	13.8	91	85.7	30.6	141	132.8	47.5	191	179.8	64.3	241	226.9	81.2	291	274,0	98.0
42	39.5	14.1	92	86.6	31.0	42	133.7	47.8	92	180.8	64.7	42	227.8	81.5	92	274.9	98.3
43	40.5	14.5	93	87.6	31.3	43	134.6	48.2	93	181.7	65.0	43	228.8	81.8	93	275.9	98.7
44	41.4	14.8	94	88.5	31.7	44	135.6	48.5	94	182.6	65.3	44	229.7	82.2	94	276.8	99.0
45	42.4	15.2	95	89.4	32.0	45	136.5	48.8	95	183.6	65.7	45	230.7	82.5	95	277.7	99.4
46	43.3	15.5	96	90.4	32.3	146	137.5	49.2	196	184.5	66.0	246	231.6	82,9	296	278.7	99.7
47	44.3	15.8	97	91.3	32.7	47	138.4	49.5	97	185.5	66.3	47	232.5	83.2	97	279.6	100.0
48	45.2	16.2	98	92.3	33.0	48	139.3	49.8	98	186.4	66.7	48	233.5	83.5	98	280.6	100.4
49	46.1	16.5	99	93.2	33.3	49	140.3	50.2	99	187.4	67.0	49	234.4	83.9	99	281.5	100.7
50	47.1	16.8	100	94.2	33.7	150	141.2	50.5	200	188.3	67.4	250	235.4	84.2	300	282.5	101.0
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Dep	Lat

Dist	La	Dep	D ft	Lat	Dep	D ft	La	Dep	Dist	Lat	Dep	Dist	Lat	Dep	D ft	Lat	Dep
1	00.9	00.4	51	47.1	19.5	101	93.3	38.7	151	139.5	57.8	201	185.7	76.9	251	231.9	96.1
2	01.8	00.8	52	48.0	19.9	02	94.2	39.0	52	140.4	58.2	02	186.6	77.3	52	232.8	96.4
3	02.8	01.1	53	49.0	20.3	03	95.2	39.4	53	141.4	58.6	03	187.6	77.7	53	233.8	96.8
4	03.7	01.5	54	49.9	20.7	04	96.1	39.8	54	142.3	58.9	04	188.5	78.1	54	234.7	97.2
5	04.6	01.9	55	50.8	21.0	05	97.0	40.2	55	143.2	59.3	05	189.4	78.5	55	235.6	97.6
6	05.5	02.3	56	51.7	21.4	106	97.9	40.6	156	144.1	59.7	206	190.3	78.8	256	236.5	98.0
7	06.5	02.7	57	52.7	21.8	07	98.9	41.0	57	145.1	60.1	07	191.3	79.2	57	237.5	98.4
8	074	03.1	58	53.6	22.2	08	99.8	41.3	58	146.0	60.5	08	192.2	79.6	58	238.4	98.7
9	08.3	03.4	59	54.5	22.6	09	100.7	41.7	59	146.9	60.9	09	193.1	80.0	59	239.3	99.1
10	09 2	03.8	60	55.4	23.0	10	101.6	42.1	60	147.8	61.2	10	194.0	80.4	60	240.2	99.5
11	10.2	04.2	61	56.4	23.3	111	102.6	42.5	161	148.8	61.6	211	194.9	80.8	261	241.1	99.9
12	11.1	04.6	62	57.3	23.7	12	103.5	42.9	62	149.7	62.0	12	195.9	81.1	62	242.1	100.3
13	12.0	05.0	63	58.2	24.1	13	104.4	43.2	63	150.6	62.4	13	196.8	81.5	63	243.0	100.7
14	12.9	05.4	64	59.1	24.5	14	105.3	43.6	64	151.3	62.8	14	197.7	81.9	64	243.9	101.0
15	13.9	05.7	65	60.1	24.9	15	106.3	44.0	65	152.5	63.1	15	198.6	82.3	65	244.8	101.4
16	14.8	06.1	66	61.0	25.3	116	107.2	44.4	166	153.4	63.5	216	199.6	82.7	266	245.8	101.8
17	15.7	06.5	67	61.9	25.6	17	108.1	44.8	67	154.3	63.9	17	200.5	83.0	67	246.7	102.2
18	16.6	06.9	68	62.8	26.0	18	109.0	45.2	68	155.2	64.3	18	201.4	83.4	68	247.6	102.6
19	17.6	07.3	69	63.8	26.4	19	109.9	45.5	69	156.1	64.7	19	202.3	83.8	69	248.5	103.0
20	18.5	07.7	70	64.7	26.8	20	110.9	45.9	70	157.1	65.1	20	203 3	84.2	70	249.5	103.3
21	19.4	08.0	71	65.6	27.2	121	111.8	46.3	171	158.0	65.4	221	204.2	84.6	271	250.4	103.7
22	20.3	08.4	72	66.5	27.6	22	112.7	46.7	72	158.9	65.8	22	205.1	85.0	72	251.3	104.1
23	21.3	08.8	73	67.5	27.9	23	113.6	47.1	73	159.8	66.2	23	206.0	85.3	73	252.2	104.5
24	22.2	09.2	74	68.4	28.3	24	114.6	47.5	74	160.8	66.6	24	207.0	85.7	74	253.2	104.9
25	23.1	09.6	75	69.3	28.7	25	115.5	47.8	75	161.7	67.0	25	207.9	86.1	75	254.1	105.2
26	24.0	10.0	76	70.2	29.1	126	116.4	48.2	176	162.6	67.4	226	208.8	86.5	276	255.0	105.6
27	24.9	10.3	77	71.1	29.5	27	117.3	48.6	77	163.5	67.7	27	209.7	86.9	77	255.9	106.0
28	25.9	10.7	78	72.1	29.9	28	118.3	49.9	78	164.5	68.1	28	210.7	87.3	78	256.9	106.4
29	26.8	11.1	79	73.0	30.2	29	119.2	49.4	79	165.4	68.5	29	211.6	87.6	79	257.8	106.8
30	27.7	11.5	80	73.9	30.6	30	120.1	49.8	80	166.3	68.9	30	212.5	88.0	80	258.7	107.2
31	28.6	11.9	81	74.8	31.0	131	121.0	50.1	181	167.2	69.3	231	213.4	88.4	281	259.6	107.5
32	29.6	12.2	82	75.8	31.4	32	122.0	50.5	82	168.2	69.7	32	214.4	88.8	82	260.6	107.9
33	30.5	12.6	83	76.7	31,8	33	122.9	50.9	83	169.1	70.0	33	215.3	89.2	83	261.5	108.3
34	31.4	13.0	84	77.6	32.1	34	123.8	51.3	84	170.0	70.4	34	216.2	89.6	84	262.4	108.7
35	32.3	13.4	85	78.5	32.5	35	124.7	51.7	85	170.9	70.8	35	217.1	89.9	85	263.3	109.1
36	33.3	13.8	86	79.5	32.9	136	125.7	52.0	186	171.9	71.2	236	218.0	90.3	286	264.2	109.5
37	34.2	14.2	87	80.4	33.3	37	126.6	52.4	87	172.8	71,6	37	219.0	90.7	87	265.2	109.8
38	35.1	14.5	88	81.3	33.7	38	127.5	52.8	88	173.7	72.0	38	219.9	91.1	88	266.1	100.2
39	36.0	14.9	89	82.2	34.1	39	128.4	53.2	89	174.6	72.3	39	220.8	91.5	89	267.0	100.6
40	37.0	15.3	90	83.2	34.4	40	129.4	53.6	90	175.6	72.7	40	221.7	91.9	90	267.9	101.0
41	37.9	15.7	91	84.1	34.8	141	130.3	54.0	191	176.5	73.1	241	222.7	92.2	291	268.9	111.4
42	38.8	16.1	92	85.0	35.2	42	131.2	54.3	92	177.4	73.5	42	223.6	92.6	92	269.8	111.8
43	39.7	16.5	93	85.9	35.6	43	132.1	54.7	93	178.3	73.9	43	224.5	93.0	93	270.7	112.1
44	40.6	16.8	94	86.9	36.0	44	133.0	55.1	94	179.2	74.2	44	225.4	93.4	94	271.6	112.5
45	41.6	17.2	95	87.8	36.4	45	134.0	55.5	95	180.2	74.6	45	226.4	93.8	95	272.6	112.9
46	42.5	17.6	96	88.7	36.7	146	134.9	55.9	196	181.1	75.	246	227.3	94.1	296	273.5	113.3
47	43.4	18.0	97	89.6	37.1	47	135.8	56.3	97	182.0	75.4	47	228.2	94.5	97	274.4	113.7
48	44.4	18.4	98	90.6	37.5	48	136.7	56.6	98	182.9	75.8	48	229.1	94.9	98	275.3	114.0
49	45.3	18.8	99	91.5	37.9	49	137.7	57.0	99	183.9	76.2	49	230.1	95.3	99	276.3	114.4
50	46.2	19.1	00	92.4	38.3	150	138.6	57.4	200	184.8	76.5	250	231.0	95.7	300	277.2	114.8
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

for 6 Points.

Difference of Latitude and Departure for 2 1/4 Points.

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.9	00.4	51	46.1	21.8	101	91.3	43.2	151	136.5	64.6	201	181.7	85.9	251	226.9	107.3
2	01.8	00.9	52	47.0	22.2	02	92.2	43.6	52	137.4	65.0	02	182.6	86.4	52	227.8	107.8
3	02.7	01.3	53	47.9	22.7	03	93.1	44.0	53	138.3	65.4	03	183.5	86.8	53	228.7	108.2
4	03 6	01.7	54	48.8	23.1	04	94.0	44.5	54	139.2	65.8	04	184.4	87.2	54	229.6	108.6
5	04.5	02.1	55	49.7	23.5	05	94.9	44.9	55	140.1	66.3	05	185.3	87.7	55	230.5	109.0
6	05.4	02.6	56	50.6	23.9	106	95.8	45.3	156	141.0	66.7	206	186.2	88.1	256	231.4	109.5
7	06.3	03 0	57	51.5	24.4	07	96.7	45.8	57	141.9	67.1	07	187.1	88.5	57	232.3	109.9
8	07.2	03.4	58	52.4	24.8	08	97.6	46.2	58	142.8	67.6	08	188.0	88.9	58	233.2	110.3
9	08.1	03.8	59	53.3	25.2	09	98.5	46.6	59	143.7	68.0	09	188.9	89.4	59	234.1	110.7
10	09.0	04.3	60	54.2	25.7	10	99.4	47.0	60	144.6	68.4	10	189.8	89.8	60	235.0	111.2
11	09.9	04.7	61	55.1	26.1	111	100.3	47.5	161	145.5	68.8	211	190.7	90.2	261	235.9	111.6
12	10.8	05.1	62	56.0	26.5	12	101.2	47.9	62	146.4	69.3	12	191.6	90.6	62	236.8	112.0
13	11.8	05.6	63	57.0	26.9	13	102.1	48.3	63	147.3	69.7	13	192.5	91.1	63	237.7	112.5
14	12.7	06.0	64	57.9	27.4	14	103.0	48.7	64	148.2	70.1	14	193.4	91.5	64	238.6	112.9
15	13.6	06.4	65	58.8	27.8	15	103.9	49.2	65	149.1	70.6	15	194.3	91.9	65	239.5	113.3
16	14.5	06.8	66	59.7	28.2	116	104.8	49.6	166	150.0	71.0	216	195.2	92.4	266	240.4	113.7
17	15.4	07 3	67	60.6	28.6	17	105.8	50.0	67	151.0	71.4	17	196.1	92.8	67	241.3	114.2
18	16.3	07.7	68	61.5	29.1	18	106.7	50,5	68	151.9	71.8	18	197.0	93.2	68	242.2	114.6
19	17.2	08.1	69	62.4	29.5	19	107.6	50.9	69	152.8	72.3	19	197.9	93.6	69	243.1	115.0
20	18.1	08.6	70	63.3	29.9	20	108.5	51.3	70	153.7	72.7	20	198.8	94.1	70	244.0	115.5
21	19 0	09 0	71	64.2	30.4	121	109.4	51.7	171	154.6	73.1	221	199.8	94.5	271	245.0	115.9
22	19.9	09.4	72	65.1	30.8	22	110.3	52.2	72	155.5	73.5	22	200.7	94.9	72	245.9	116.3
23	20 8	09.8	73	66.0	31.2	23	111.2	52.6	73	156.4	74.0	23	201.6	95.4	73	246.8	116.7
24	21.7	10.3	74	66,9	31.6	24	112.1	53.0	74	157.3	74.4	24	202.5	95.8	74	247.7	117.2
25	22.6	10.7	75	67.8	32.1	25	113.0	53.5	75	158.2	74.8	25	203.4	96.2	75	248.6	117.6
26	23 5	11.1	76	68.7	32.5	126	113,9	53.9	176	159.1	75.3	226	204.3	96.6	276	249.5	118.0
27	24.4	11.5	77	69.6	32.9	27	114.8	54.3	77	160.0	75.7	27	205.2	97.1	77	250.4	118.4
28	25.3	12.0	78	70.5	33,4	28	115.7	54.7	78	160.9	76.1	28	206.1	97.5	78	251.3	118.9
29	26.2	12.4	79	71.4	33.8	29	116,6	55.2	79	161.8	76.5	29	207.0	97.9	79	252.2	119.3
30	27 1	12.8	80	72,3	34.2	30	117.5	55.6	80	162.7	77.0	30	207.9	98.3	80	253.1	119.7
31	28.0	13.3	81	73.2	34.6	131	118.4	56.0	181	163.6	77.4	231	208.8	98.8	281	254.0	120.2
32	28.9	13.7	82	74.1	35.1	32	119.3	56.4	82	164.5	77.8	32	209.7	99.2	82	254.9	120.6
33	29.8	14.1	83	75.0	35.5	33	120.2	56.9	83	165.4	78.2	33	210.6	99.6	83	255.8	121.0
34	30.7	14.5	84	75.9	35.9	34	121.1	57,3	84	166.3	78.7	34	211.5	100.1	84	256.7	121.4
35	31.6	15.0	85	76.8	36,3	35	122.0	57.7	85	167.2	79.1	35	212.4	100.5	85	257.6	121.9
36	32.5	15.4	86	77.7	36.8	136	122,9	58.2	186	168.1	79.5	236	213.3	100.9	286	258.5	122.3
37	33.4	15.8	87	78.6	37.2	37	123.8	58.6	87	169.0	80.0	37	214.2	101.3	87	259.4	122.7
38	34.4	16.2	88	79,6	37.6	38	124.7	59,0	88	169.9	80.4	38	215.1	101.8	88	260.3	123.1
39	35.3	16.7	89	80.5	38.1	39	125.6	59.4	89	170.8	80.8	39	216.0	102.2	89	261.2	123.6
40	36.2	17.1	90	81.4	38.5	40	126.5	59.9	90	171.7	81.2	40	216.9	102.6	90	262.1	124.0
41	37.1	17.5	91	82.3	38.9	141	127.4	60.3	191	172.6	81.7	241	217.8	103.0	291	263.0	124.5
42	38.0	18.0	92	83.2	39.3	42	128.4	60.7	92	173.6	82.1	42	218.7	103.5	92	263.9	124.9
43	38.8	18.4	93	84.1	39.8	43	129.3	61.1	93	174.5	82 5	43	219.6	103.9	93	264.8	125.3
44	39.9	18.8	94	85.0	40.2	44	130.2	61.6	94	175.4	83.0	44	220.5	104.3	94	265.7	125.7
45	40.7	19 2	95	85.9	40.6	45	131.1	62,0	95	176.3	83.4	45	221.4	104,8	95	266.6	126.1
46	41.6	19.7	96	86.8	41.0	146	132.0	62.4	196	177.2	83.8	246	222.4	105.2	296	267.6	126.6
47	42.5	20.1	97	87.7	41.5	47	132 9	62.9	97	178.1	84.2	47	223.3	105.6	97	268.5	127.0
48	43.4	20.5	98	88.6	41.9	48	133.8	63,3	98	179.0	84.7	48	224.2	106.0	98	269.4	127.4
49	44,3	21.0	99	89.5	42.3	49	134.7	63.7	99	179.9	85.1	49	225.1	106.5	99	270.3	127.8
50	45.2	21.4	100	90.4	42.8	50	135.6	64.1	200	180.8	85.5	50	226.0	106.9	300	271.2	128.3
Dist	Dep	Lat	D ft	Dep	Lat	D ft	Dep	La	Dist	Dep	Lat	D ft	Dep	Lat	Dist	Dep	Lat

for 5 3/4 Points.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.9	00.5	51	45.0	24.0	101	89.1	47.6	151	133.2	71.1	201	177.3	94.7	251	221.4	118.3
2	01.8	00.9	52	45.9	24.5	02	90.0	48.1	52	134.1	71,6	02	178.2	95.2	52	222.3	118.7
3	02.6	01.4	53	46.7	25.0	03	90.8	48.5	53	134.9	72.1	03	179.0	95.6	53	223.1	119.2
4	03.5	01.9	54	47.6	25.4	04	91.7	49.0	54	135.8	72.6	04	179.9	96.1	54	224.0	119.7
5	04.4	02.4	55	48.5	25.9	05	92.6	49.5	55	136.7	73.0	05	180.8	96.6	55	224.9	120.1
6	05.3	02.8	56	49.4	26.4	106	93.5	49.9	156	137.6	73.5	206	181.7	97.1	256	225.8	120.6
7	06.2	03.3	57	50.3	26.9	07	94.4	50.4	57	138.5	74.0	07	182.6	97.5	57	226.7	121,1
8	07.1	03.8	58	51.2	27.3	08	95.3	50.9	58	139.4	74.4	08	183,5	98.0	58	227.6	121.6
9	07.9	04.2	59	52.0	27.8	09	96.1	51.4	59	140.2	74.9	09	184.3	98.5	59	228.4	122.0
10	08.8	04.7	60	52.9	28.3	10	97.0	51.8	60	141.1	75.4	10	185.2	98.9	60	229.3	122.5
11	09.7	05.2	61	53.8	28.7	111	97.9	52.3	161	142.0	75.9	211	186.1	99.4	261	230.2	123.0
12	10.6	05.7	62	54.7	29.2	12	98.8	52.8	62	142.9	76.3	12	187.0	99.9	62	231.1	123.4
13	11.5	06.1	63	55.6	29.7	13	99.7	53.2	63	143.8	76.8	13	187.9	100.4	63	232.0	123.9
14	12.3	06.6	64	56.4	30.2	14	100.5	53.7	64	144.6	77.3	14	188,7	100.8	64	232.8	124.4
15	13.2	07.1	65	57.3	30.6	15	101.4	54.2	65	145.5	77.7	15	189.6	101.3	65	233.7	124.9
16	14.1	07.5	66	58.2	31.1	116	102.3	54.7	166	146.4	78.2	216	190.5	101.8	266	234.6	125.3
17	15.0	08.0	67	59.1	31.6	17	103.2	55.1	67	147.3	78.7	17	191.4	102.2	67	235.5	125.8
18	15.9	08.5	68	60.0	32.0	18	104.1	55.6	68	148.2	79.2	18	192.3	102.7	68	236.4	126.3
19	16.8	09.0	69	60.9	32.5	19	105.0	56.1	69	149.1	79.6	19	193.2	103.2	69	237.3	126.7
20	17.6	09.4	70	61.7	33.0	20	105.8	56.5	70	149.9	80.1	20	194.0	103.7	70	238.1	127.2
21	18.5	09.9	71	62.6	33.5	121	106.7	57.0	171	150.8	80.6	221	194.9	104.1	271	239.0	127.7
22	19.4	10.4	72	63.5	33.9	22	107.6	57.5	72	151.7	81.0	22	195.8	104.6	72	239.9	128.2
23	20.3	10.8	73	64.4	34.4	23	108.5	58.0	73	152.6	81.5	23	196.7	105.1	73	240.8	128.6
24	21.2	11.3	74	65.3	34.9	24	109.4	58.4	74	153.5	82.0	24	197.6	105.5	74	241.7	129.1
25	22.1	11.8	75	66.2	35.3	25	110.3	58.9	75	154.3	82.5	25	198.4	106.0	75	242.5	129.6
26	22.9	12.3	76	67.0	35.8	126	111.1	59.4	176	155.2	82.9	226	199.3	106.5	276	243.4	130.0
27	23.8	12.7	77	67.9	36.3	27	112.0	59.8	77	156.1	83.4	27	200.2	107.0	77	244.3	130.5
28	24.7	13.2	78	68.8	36.8	28	112.9	60.3	78	157.0	83.9	28	201.1	107.4	78	245.2	131.0
29	25.6	13.7	79	69.7	37.2	29	113.8	60.8	79	157.9	84.3	29	202.0	107.9	79	246.1	131.5
30	26.5	14.1	80	70.6	37.7	30	114.7	61.3	80	158.8	84.8	30	202 9	108.4	80	247.0	131.9
31	27.3	14.6	81	71.4	38.2	131	115.5	61.7	181	159.6	85.3	231	203.7	108.8	281	247.8	132.4
32	28.2	15.1	82	72.3	38.6	32	116.4	62.2	82	160.5	85.8	32	204,6	109.3	82	248.7	132.9
33	29.1	15.5	83	73.2	39.1	33	117.3	62.7	83	161.4	86.2	33	205.5	109.8	83	249.6	133.3
34	30.0	16.0	84	74.1	39.6	34	118.2	63.1	84	162.3	86.7	34	206.4	110.3	84	250.5	133.8
35	30.9	16.5	85	75.0	40.1	35	119.1	63.6	85	163.2	87.2	35	207.3	110.7	85	251.4	134.3
36	31.8	17.0	86	75.9	40.5	136	120.0	64.1	186	164.1	87.6	236	208.2	111.2	286	252.3	134.8
37	32.6	17.4	87	76.7	41.0	37	120.8	64.5	87	164.9	88.1	37	209.0	111.7	87	253.1	135.2
38	33.5	17.9	88	77.6	41.5	38	121.7	65.0	88	165.8	88.6	38	209.9	112.1	88	254.0	135.7
39	34.4	18.4	89	78.5	41.9	39	122.6	65.5	89	166.7	89.1	39	210.8	112.6	89	254.9	136.2
40	35.3	18.8	90	79.4	42.4	40	123.5	66.0	90	167.6	89.5	40	211.7	113.1	90	255.8	136.6
41	36.2	19.3	91	80.3	42.9	141	124.4	66.4	191	168.5	90.0	241	212.6	113.5	291	256.7	137.1
42	37.0	19.8	92	81.1	43.4	42	125.2	66.9	92	169.3	90.5	42	213.4	114.0	92	257.5	137.6
43	37.9	20.3	93	82.0	43.8	43	126.1	67.4	93	170.2	90.9	43	214.3	114.5	93	258.4	138.1
44	38.8	20.7	94	82.9	44.3	44	127.0	67.8	94	171.1	91.4	44	215.2	115.0	94	259.3	138.5
45	39.7	21.2	95	83.8	44.8	45	127.9	68.3	95	172.0	91.9	45	216.1	115.4	95	260.2	139.0
46	40.6	21.7	96	84.7	45.2	146	128.8	68.8	196	172.9	92.4	246	217.0	115.9	296	261.1	139.5
47	41.5	22.1	97	85.6	45,7	47	129.7	69.3	97	173.8	92.8	47	217.9	116.4	97	262.0	139.9
48	42.3	22.6	98	86.4	46.2	48	130.5	69.7	98	174.6	93.3	48	218.7	116.8	98	262.8	140.4
49	43.2	23.1	99	87.3	46.6	49	131.4	70.2	99	175.5	93.8	49	219.6	117.3	99	263.7	140.9
50	44.1	23.6	100	88.2	47.1	150	132.3	70.7	200	176.4	94.2	250	120.7	117.8	300	264.6	151.4
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

for 5½ Points.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.9	00.6	51	43.7	26.2	101	86.6	51.9	151	129.5	77.6	201	172.4	103.3	251	215.3	129.0
2	01.7	01.0	52	44.6	26.7	02	87.5	52.4	52	120.4	78.1	02	173.3	103.8	52	216.1	129.5
3	02.6	01.6	53	45,5	27.2	03	88.3	52.9	53	131.2	78.6	03	174.1	104.3	53	217.0	130.0
4	03.4	02.1	54	46.3	27.8	04	89.2	53.4	54	132.1	79.1	04	175.0	104,8	54	217.9	130.5
5	04.3	02.6	55	47.2	28.3	05	90.1	54.0	55	132 9	79.7	05	175.8	105.4	55	218.7	131.0
6	05.1	03.1	56	48.0	28.8	106	90.9	54.5	156	133.8	80.2	206	176.7	105.9	256	219.6	131.6
7	06.0	03.6	57	48.9	29.3	07	91.8	55.0	57	134.7	80.7	07	177.5	106.4	57	220.4	132.1
8	06.9	04.1	58	49.7	29.8	08	92.6	55.5	58	135.5	81.2	08	178.4	106.9	58	221.3	132.6
9	07.7	04.6	59	50.6	30.3	09	93.5	56.0	59	136.4	81.7	09	179.3	107.4	59	222.1	133.1
10	08.6	05.1	60	51.5	30.8	10	94.3	56.5	60	137.2	82.2	10	180.1	107.9	60	223.0	133.6
11	09.4	05.7	61	52.3	31.4	111	95.2	57,0	161	138.1	82 7	211	181.0	108.4	261	223.9	134.1
12	10.3	06.2	62	53.2	31.9	12	96.1	57.6	62	138.9	83.3	12	181.8	109.0	62	224.7	134.6
13	11.2	06.7	63	54.0	32.4	13	96.9	58.1	63	139.8	83.8	13	182.7	109.5	63	225.6	135.2
14	12.0	07.2	64	54.9	32.9	14	97.8	58.6	64	140.7	84.3	14	183.5	110.0	64	226.4	135.7
15	12.9	07.7	65	55.8	33,4	15	98.6	59,1	65	141.5	84.8	15	184.4	110.5	65	227.3	136.2
16	13.7	08.2	66	56.6	33.9	116	99.5	59.6	166	143.4	85.3	216	185.3	111.0	266	228.1	136.7
17	14.6	08.7	67	57.5	34.4	17	100.4	60.1	67	143.2	85.8	17	186.1	111.6	67	229.0	137.2
18	15.4	09.3	68	58.3	55.0	18	101.2	60.6	68	144.1	86.3	18	187.0	112.0	68	229.9	137.7
19	16.3	09.8	69	59.2	35.5	19	102.1	61.2	69	145.0	86.9	19	187.8	112.6	69	230.7	138.2
20	17.2	10.3	70	60.0	36,0	20	102.9	61.7	70	145.8	87.4	20	188.7	113.1	70	231.6	138.8
21	18.0	10.8	71	60.9	36.5	121	103.8	62,2	171	146.7	87.9	221	189.6	113.6	271	232.4	139.3
22	18.9	11.3	72	61.8	37.0	22	104.6	62.7	72	147.5	88.4	22	190.4	114.1	72	233.3	139.8
23	19.7	11.8	73	62.6	37.6	23	105.5	63,2	73	148.4	88.9	23	191.3	114.6	73	234.2	140.3
24	20 6	12.3	74	63.5	38.0	24	106.4	63.7	74	149.2	89.4	24	192.1	115.1	74	235.0	140.8
25	21.4	12.9	75	64.3	38.6	25	107.2	64.2	75	140.1	89.9	25	193.0	115.6	75	235.9	141.3
26	22.3	13.4	76	65.2	39.1	126	108.1	64.8	176	151.0	90.4	226	193.8	116.1	276	236.7	141.8
27	23 2	13.9	77	66.0	39.6	27	108.9	65.3	77	151.8	91.0	27	194.7	116.7	77	237.6	142.4
28	24.0	14.4	78	66,9	40.1	28	109.8	65.8	78	152.7	91.5	28	195.6	117.2	78	238.4	142.9
29	24.9	14.9	79	67.8	40.6	29	110.6	66.3	79	153.5	92.0	29	196.4	117.7	79	239.3	143.4
30	25.7	15.4	80	68.6	41.1	30	111.5	66.8	80	154.4	92.5	30	197.3	118.2	80	240.2	143.9
31	26.6	15.9	81	69.5	41.6	131	112.4	67.3	181	155.2	93.0	231	198.1	118.7	281	241.0	144.4
32	27 4	16.4	82	70.3	42.1	32	113.2	67.8	82	156.1	93.5	32	199.0	119.2	82	241.9	144.9
33	28.3	17.0	83	71.2	42.7	33	114,1	68.4	83	157.0	94.0	33	199.8	119.7	83	242.7	145.4
34	29.2	17.5	84	72,0	43.2	34	114.9	68.9	84	157.8	94.6	34	200.7	120.3	84	243.6	146.0
35	30.0	18.0	85	12.9	43.7	35	115.8	69.4	85	158.7	95.1	35	201.6	120.8	85	244.4	146.5
36	30.9	18.5	86	73.8	44.2	136	116,6	69.9	186	159.5	95.6	236	202.4	121.3	286	245.3	147.0
37	31.7	19 0	87	74.6	44.7	37	117.5	70.4	87	160.4	96.1	37	203.3	121.8	87	246.2	147.5
38	32.6	19.5	88	75.5	45.2	38	118.4	70.9	88	161.2	96.6	38	204.1	122.3	88	247.0	148.0
39	33.5	20.0	89	76.3	45.7	39	119.2	71.4	89	162.1	97.1	39	205.0	122.8	89	247.9	148.6
40	34.3	20.6	90	77.2	46.3	40	120.1	72.0	90	163.0	97.6	40	205.8	123.3	90	248.7	149.0
41	35.2	21.1	91	78.1	46.8	141	120,9	72.5	191	163.8	98.2	241	206.7	123.9	291	249.6	149.6
42	36.0	21.6	92	78.9	47.3	42	121.8	73.0	92	164.7	98.7	42	207.6	124.4	92	250.4	150.1
43	36.9	22.1	93	79,8	47.8	43	122.7	73.5	93	165.5	99.2	43	208.4	124.9	93	251.3	150.6
44	37.7	22.6	94	80.6	48.3	44	123.5	74.0	94	166.4	99.7	44	209.3	125.4	94	252.2	151.1
45	38.6	23.1	95	81.5	48.8	45	124.4	74.6	95	167.3	100.2	45	210.1	125.9	95	253.0	151.6
46	39.5	23.6	96	82.3	49.3	146	125.2	75.0	196	168.1	100.7	246	211.0	126.4	296	253.9	152.1
47	40.3	24.2	97	83.2	49.9	47	126.1	75.6	97	169.0	101.2	47	211.9	126.9	97	254.7	152.6
48	41.2	24.7	98	84.1	50.4	48	126.9	76.1	98	169.8	101.8	48	212.7	127.4	98	255.6	153.1
49	42.0	25,2	99	84.9	50,9	49	127.8	76.6	99	170.7	102.3	49	213.6	128.0	99	256.5	153.7
50	42.9	25.7	100	85.8	51.4	50	128.7	77.1	200	171.5	102.8	50	214.4	128.5	300	257.3	154.2
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

for 5 1/4 Points.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep
1	00.8	00.6	51	42.4	28.3	101	84.0	56.1	151	125.5	83.9	201	167.1	111.7	251	208.7	139.4
2	01.7	01.1	52	43.2	28.9	02	84.8	56.7	52	126.4	84.4	02	167.9	112.2	52	209.5	140.0
3	02.5	01.7	53	44.1	29.4	03	85.6	57.2	53	127.2	85.5	03	168.8	112 8	53	210.3	140.5
4	03.3	02.2	54	44.9	30.0	04	86.5	57.8	54	128.0	86.5	04	169.6	113.3	54	211.2	141.1
5	04.2	02.8	55	45.7	30.6	05	87.3	58.3	55	128.9	87.1	05	170.4	113.9	55	212.0	141.7
6	05.0	03.3	56	46.6	31.1	106	88.1	58.9	156	129.7	86.7	206	171.3	114.4	256	212.8	142.2
7	05.8	03.9	57	47.4	31.7	07	89.0	59.4	57	130.5	87.2	07	172.1	115.0	57	213.7	142.8
8	06.7	04.4	58	48.2	32.2	08	89.8	60.0	58	131.4	87.8	08	172.9	115.5	88	214.5	143.3
9	07.5	05.0	59	49.1	32.8	09	90.6	60.5	59	132.2	88.3	09	173.8	111.1	59	215.3	143.9
10	08.3	05.6	60	49.9	33.3	10	91.4	61.1	60	133.0	88.9	10	174.6	116.7	60	216.1	144.4
11	09.1	06.1	61	50.7	33.9	111	92.3	61.7	161	133.8	89.4	211	175.4	117.2	261	217.0	145.0
12	10.0	06.7	62	51.5	34.4	12	93.1	62.2	62	134.7	90.0	12	176.2	117.8	62	217.8	145.8
13	10.8	07.2	63	52.4	35.0	13	93.9	62.8	63	135.5	90.5	13	177.1	118.3	63	218.6	146.1
14	11.6	07.8	64	53.2	35.6	15	94.8	63.3	64	136.3	91.1	14	177.9	118.9	64	219.5	146.7
15	12.5	08.3	65	54.0	36.1	15	95.6	63.9	65	137.2	91.7	15	178.7	119.4	65	220.3	147.2
16	13.3	08.9	66	54.9	36.7	116	96.4	64.4	166	138 0	92.2	216	179.6	120.0	266	221.1	147.8
17	14.1	09.4	67	55.7	37.2	17	97.3	65.0	67	138.8	92.8	17	180.4	120.5	67	222.0	148.3
18	15.0	10.0	68	56.5	37.8	18	98.1	65.5	68	139.7	93.3	18	181.2	121.1	68	222.8	148.9
19	15.8	10.6	69	57.4	38.3	19	98.9	66.1	69	140.5	93.9	19	182.1	121.7	69	223.6	149.4
20	16.6	11.1	70	58.2	38.9	20	99.8	66.7	70	141.3	94.4	20	182.9	122.2	70	224.5	150.0
21	17.5	11.7	71	59.0	39.4	121	100.6	67.2	171	142.2	95.0	121	183.7	122.8	271	225.3	150.5
22	18.3	12.2	72	59.9	40.0	22	101.4	67.8	72	143.0	95.5	22	184.6	123.3	72	226.1	151.1
23	19.1	12.8	73	60.7	40.6	23	102.3	68.3	73	143.8	96.1	23	185.4	123.9	73	227.0	151.7
24	20.0	13.3	74	61.5	41.1	24	103.1	68.9	74	144.7	96.7	24	186.2	124.4	74	227.8	152.2
25	20.8	13.9	75	62.4	41.7	25	103.9	69.4	75	145.5	97.2	25	18.71	125.0	75	228.6	152.8
26	21.6	14.4	76	63.2	42.2	126	104.8	70.0	176	146.3	97.8	226	187.9	125.5	276	229.4	153.3
27	22.4	15.0	77	64.0	42.8	27	105.6	70.5	77	147.1	98.3	27	188.7	126.1	77	230.3	153.9
28	23.3	15.6	78	64.8	43.3	28	106.4	71.1	38	148.0	93.9	28	189,5	126.7	78	231.1	154.4
29	24.1	16.1	79	65.7	43.9	29	107.2	71.7	79	148.8	99.4	29	190.4	127.2	79	231.9	155.0
30	24 9	16.7	80	66.5	44.4	30	108.1	72.2	80	149.6	100.0	30	191.2	127.8	80	232.8	155.5
31	25.8	17.2	81	67.3	45.0	131	108.9	72.8	181	250.5	100.5	231	192.0	128.3	281	233.6	156.1
32	26.6	17.8	82	68.2	45.6	32	109.7	73.3	82	151.3	101.1	32	192.9	128.9	82	234.4	156.7
33	2-.4	18.3	83	69.0	46.1	33	110.6	73.9	83	152.1	101.7	33	193.7	129.4	83	235.3	157.2
34	28.3	18.9	84	69.8	47.7	34	111.4	74.4	84	153.0	102.2	34	194,5	130°0	84	236.1	157.8
35	29.1	19.4	85	70.7	47.2	35	112.2	75.0	85	153.8	102.8	35	195.4	150.5	85	236.4	158.3
36	29.9	20.0	86	71.5	47.8	136	113.1	75.5	186	154.6	103.3	236	196.2	131.1	286	237.8	158.9
37	30.8	20.6	87	72.3	48.3	37	113.9	76.1	87	155.5	103.9	37	197.0	131.7	87	238,6	159.4
38	31.6	21.1	88	73.2	48.9	38	114.7	76.7	88	156.3	104.4	38	197.9	132.2	88	239.4	160.0
39	32.4	21.7	89	74.0	49.4	39	115.6	77.2	89	157.1	105.0	39	198.7	132.8	89	240.3	160.5
40	33.3	22.2	90	74.8	50.0	40	116.4	77.8	90	158.0	105.5	40	199.5	133.3	90	241.1	161.1
41	34.1	22.8	91	75.7	50.6	141	117.2	78.3	191	158.8	106.1	241	200.4	133.9	291	241.9	161.7
42	34.9	23.3	92	76.5	51.1	42	118.1	78.9	92	159.6	106.7	42	201.2	134.4	92	242.8	162.2
43	35.8	23.9	93	77.3	51.7	43	118.9	79.4	93	160.4	107.2	43	202.0	135.0	93	243.6	162.8
44	36.6	24.4	94	78.1	52.2	44	119.7	80.0	94	161.3	107·8	44	202.8	135.5	94	244.4	163.3
45	37.4	25.0	95	79.0	52.8	45	120.5	80.5	95	162.1	108.3	45	203.7	136.1	95	245.2	163.9
46	38.2	25.6	96	79.8	53.3	146	121.4	81.1	196	162.9	108.9	246	204.5	136.7	296	246.1	164.4
47	39.1	26.1	97	80.6	53.9	47	122.2	81.7	79	163.8	109.4	47	205.3	137.2	97	246.9	165.0
48	39.9	26.7	98	81.5	54.4	48	123.0	82.2	98	164.6	110.0	48	206.2	137.8	98	247.7	165.5
49	40.7	27.2	99	82.3	55.0	49	123.9	82.8	99	165.4	110.5	49	207.0	138.3	99	248.5	166.1
50	41.6	27.6	100	83.1	55.6	150	124.7	83.3	200	166.3	111.1	250	207.8	138.9	300	249.4	166.7
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

for 5 Points.

Difference of Latitude and Departure for 3 ¼ Points.

Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	00.8	00.6	51	41.0	30.4	101	81.1	60.2	151	121.3	90.0	201	161.4	119.7	251	201.6	149.5
2	01.6	01.2	52	41.8	31.0	02	81.9	60.8	52	122.1	90.6	02	162.2	120.3	52	202.4	150.1
3	02.4	02.8	53	42 6	31.6	03	82.7	61.4	53	122.9	91.1	03	163.0	120.9	53	203.2	150.7
4	03.2	02.4	54	43.4	32.2	04	83.5	62.0	54	123.7	91.7	04	163.8	121.5	54	204.0	151.3
5	04.0	03.0	55	44.2	32.8	05	84.3	62.6	55	124.5	92.3	05	164.6	122.1	55	204.8	151.9
6	04.8	03.6	56	45.0	33.6	106	85.1	63.1	156	125.5	92.9	206	165.4	122.7	256	205.6	152.5
7	05.6	04.2	57	45.8	34.0	07	85.9	63.7	57	126.1	93.5	07	166.2	123.3	57	206.4	153.1
8	06.4	04.8	58	46.6	34.6	08	86.7	64.3	56	126.9	94.1	08	167.0	123.9	58	207.2	153.7
9	07.2	05.4	59	47.4	35.1	09	87.5	64.9	59	127.7	94.7	09	167.8	124.5	59	208.0	154.3
10	08.0	06.0	60	48,2	35.7	10	88.3	65.5	60	128.5	95.3	10	168.6	125.1	60	228.8	154.9
11	08.8	06,6	61	49.0	36.3	111	89.1	66.1	161	129.3	95.9	211	169.4	125.7	261	209.6	155.5
12	09.6	07.1	62	49.8	36.9	12	89.9	66.7	62	130.1	96.5	12	170.2	126.3	62	210.4	156.1
13	10.4	07.7	63	50.6	37.5	13	90.7	67.3	63	130.9	97.1	13	171.0	126.9	63	211.2	156.7
14	11.2	08.3	64	51.4	38.1	14	91.5	67.9	64	131,7	97.7	14	171.8	127.5	64	212.0	157.3
15	12.0	08.9	65	52.2	38.7	15	92.4	68.5	65	132.5	98.3	15	172.7	128.1	65	212.8	157.9
16	12.8	09.5	66	53.0	39.3	116	93.2	69.1	166	133.3	98.9	216	173.5	128.7	266	213.6	158.5
17	13.7	10.3	67	53.8	39.9	17	94.0	69.7	67	134.1	99,1	17	174.3	129.3	67	214.4	159.1
18	14.5	10.7	68	54.6	40,5	18	94.8	70.3	68	134.9	100.5	18	175.1	129.9	68	215.2	159.7
19	15.3	11.3	69	55.4	41.1	19	95.6	70,9	69	135.7	100.7	19	175.9	130.5	69	216.0	160.3
20	16.1	11.9	70	56.2	41.7	20	96.4	71.5	70	136.5	101.3	20	176.7	131.1	70	216.8	160.9
21	16.9	12.5	71	57.0	42.3	121	97.2	72.1	171	137.3	101.9	221	177.5	131.7	271	217.6	161.4
22	17.7	13.1	72	57.8	42.9	22	98.0	72.7	72	138.1	102.5	22	178.3	132.3	72	218.4	162.0
23	18.5	13.7	73	58.6	43.5	23	98.8	73.3	73	138.9	103.1	23	179.1	132.9	73	219.2	162.6
24	19.3	14.3	74	59.4	44.1	24	99,6	73.9	74	139.7	103.7	24	179.9	133.4	74	220.0	163.2
25	20.6	14.9	75	60.2	44.7	25	100.4	74.5	75	140.5	104.3	25	180.7	134.0	75	220.8	163.8
26	20.9	15.5	76	61.0	45.3	126	101.2	75.1	176	141.3	104.9	226	181.5	134.6	276	221.6	164.4
27	21.7	16.1	77	61.8	45.9	27	102.0	75.7	77	142.1	105.4	27	182.3	135.2	77	222.4	165.0
28	22.5	16.7	78	62.6	46.5	28	102.8	76.3	78	142.9	106.0	28	183.1	135.8	78	223.2	165.6
29	23.3	17.3	79	63.4	47.1	29	103.6	76.9	79	143.7	106.6	29	183.9	136.4	79	224.0	165.2
30	24.1	17.9	80	64.2	47.7	30	104.4	77.4	80	144.5	107.2	30	184.7	137.0	80	224.8	166.8
31	24.9	18.5	81	65,0	48.3	131	105.2	78.0	181	145.4	107.8	231	185.5	137.6	281	225.7	167.4
32	25.7	19.1	82	65.8	49.9	32	106.0	78.6	82	146.2	108.4	32	186.3	138.2	82	226.5	167.0
33	26.5	19.7	83	66.7	49.4	33	106.8	79.2	83	147.0	109.0	33	187.1	138.8	83	227.3	168.6
34	27.3	20.3	84	67.5	50.0	34	107.6	79,8	84	147.8	109.6	34	187.9	139.4	84	228.1	168.2
35	28.1	20.9	85	68.3	50.6	35	108.4	80.4	85	148.6	110.2	35	188.7	140.0	85	228.9	169.8
36	28.9	21.4	86	69.1	51.2	136	109.2	81.0	186	149.4	110.8	236	189.5	140,6	286	229.7	170.4
37	29.7	22.0	87	69.9	51.8	37	110.0	81.6	87	150.2	111.4	37	190.3	141.2	87	230.5	171.0
38	30.5	22.6	88	70.7	52.4	38	110.8	82.2	88	151.0	112.0	38	191.1	141.8	88	231.3	171.6
39	31.3	23.2	89	71.5	53.0	39	111.6	82.8	89	151.8	112.6	39	191.9	142.4	89	232.1	172,2
40	32.1	23.8	90	72.3	53.6	40	112.4	83.4	90	152.6	113.2	40	192.7	143.0	90	232.9	172.8
41	32.9	24.4	91	73.1	54.2	141	113.2	84.0	191	153.4	113.8	241	193.5	143.6	291	233.7	173.4
42	33.7	25.0	92	73.9	54.8	42	114.0	84.6	92	154.2	114.4	42	194.3	144.2	92	234.5	174.0
43	34.5	25.6	93	74.7	55.4	43	114.8	85.2	93	155.0	115.0	43	195,1	144.8	93	235.3	174.6
44	35.3	26.2	94	75.5	56.0	44	115.6	85.8	94	155.8	115.6	44	195.9	145.4	94	236.1	175.1
45	36.1	26,8	95	76.3	56.6	45	116.4	86.4	95	156.6	116.2	45	196.7	146.0	95	236.9	175.7
46	36.9	27.4	96	77.1	57.2	146	117.2	87.0	196	157.4	116.8	246	197.5	146.6	296	237.7	176.3
47	37.7	28.0	97	77.9	57.8	47	118.0	87.6	97	158.2	117.4	47	198.4	147.1	97	238.5	176.9
48	38.5	28.6	98	78.7	58.4	48	118.8	88.2	98	159.0	118.0	48	199.2	147.7	98	239.3	177.5
49	39.4	29,2	99	79.5	59.0	49	119.7	88.8	99	159.8	118.6	49	200.0	148.3	99	240.1	178.1
50	40.2	29.8	100	80.3	59.6	150	120.5	89.4	200	160.6	119.1	250	200.8	148.9	300	240.9	178.7
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Dep	Lat

for 4¾ Points.

Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat	Dep	Dist	Lat.	Dep
1	00.8	00.6	51	39.4	32.3	101	78.1	64.0	151	116.7	95.8	201	155.3	127.5	251	194.0	159.2
2	01.5	01.3	52	40.2	33.0	02	78.8	64.7	52	117.5	96.4	02	156.1	128.1	52	194.7	159.8
3	02.3	01.9	53	41.0	33.6	03	79.6	65.3	53	118.2	97.0	03	156.9	128.7	53	195.5	160.4
4	03.1	02.5	54	41.7	34.2	04	80.4	66.0	54	119.0	97.7	04	157.6	129.4	54	196.3	161.1
5	03.9	03.2	55	42.5	34.9	05	81.1	66.6	55	119.8	98.3	05	158.4	130.0	55	197.1	161.7
6	04.6	03.8	56	43.3	35.5	106	81.9	67.2	156	120.6	98.9	206	159.2	130.6	256	197.8	162.3
7	05.4	04.4	57	44.1	36.1	07	82.7	67.9	57	121.3	99.6	07	160.0	131.3	57	198.6	163.0
8	06.2	05.1	58	44.8	36.8	08	83.5	68.5	58	122.1	100.2	08	160.7	131.9	88	199.4	163.6
9	07.0	05.7	59	45.6	37.4	09	84.2	69.1	59	122.9	100.8	09	161.5	132.5	59	200.1	164.2
10	07.7	06.3	60	46.4	38.0	10	85.0	69.8	60	123.6	101.5	10	162.3	133.2	60	200 9	164.9
11	08.5	07.0	61	47.1	38.7	111	85.8	70.4	161	124.4	102.1	211	163.1	133.8	261	201.7	165.5
12	09.3	07.6	62	47.9	39.3	12	86.6	71.0	62	125.2	102.7	12	163.8	134.4	62	202.5	166.1
13	10.1	08.2	63	48.7	40.0	13	87.3	71.7	63	126.0	103.4	13	164.6	135.1	63	203.2	166.8
14	10.8	08.9	64	49.5	40.6	15	88.1	72.3	64	126.7	104.0	14	165.4	135.7	64	204.0	167.4
15	11.6	09.5	65	50.2	41.2	15	88.9	72.9	65	127.5	104.6	15	166.1	136.3	65	204.8	168.0
16	12.4	10.1	66	51.0	41.9	116	89.6	73.6	166	128.3	105.3	216	166.9	137.0	266	205.6	168.7
17	13.1	10.8	67	51.8	42.5	17	90.4	74.2	67	129.1	105.9	17	167.7	137.6	67	206.3	169.3
18	13.9	11.4	68	52.6	43.1	18	91.2	74.8	68	129.8	106.5	18	168.5	138.2	68	207.1	170.0
19	14.7	12.0	69	53.3	43.8	19	92.0	75.4	69	130.6	107.2	19	169.2	138.9	69	297.9	170.6
20	15.5	12.7	70	54.1	44.4	20	92.7	76.1	70	131.4	107.8	20	170.0	139.5	70	208.6	171.2
21	16.2	13.3	71	54.9	45.0	121	93.5	76.7	171	132.1	108.4	121	170.8	140.1	271	209.4	171.9
22	17.0	14.0	72	55.6	45.7	22	94.3	77.4	72	132.9	109.1	22	171.6	140.8	72	210.2	172.5
23	17.8	14.6	73	56.4	46.3	23	95.2	78.0	73	133.7	109.7	23	172.3	141.4	73	211.0	173.1
24	18.5	15.2	74	57.2	46.9	24	95.8	78.6	74	134.5	110.3	24	173.1	142.0	74	211.7	173.8
25	19.3	15.9	75	58.0	47.6	25	96.6	79.3	75	135.2	111.0	25	173.9	142.7	75	212.5	174.4
26	20.1	16.5	76	58.7	48.2	126	97.4	79.9	176	136.0	111.6	226	174.6	143.3	276	213.3	175.0
27	20 9	17.1	77	59.5	48.8	27	98.1	80.5	77	136.8	112.2	27	175.4	144.0	77	214.1	175.7
28	21.6	17.8	78	60.3	49.5	28	98.9	81.2	38	137.6	112.9	28	176.2	144.6	78	214.8	176.3
29	22.4	18.4	79	61.1	50.1	29	99.7	81.8	79	138.3	113.5	29	177.0	145.2	79	215.6	176.9
30	23.2	19.0	80	61.8	50.7	30	100.5	82.4	80	139.1	114.1	30	177.7	145.9	80	216.4	177.6
31	24.0	19.7	81	62.6	51.4	131	101.2	83.1	181	139.9	114.8	231	178.5	146.5	281	217.1	178.2
32	24.7	20.3	82	63.4	52.0	32	102.0	83.7	82	140.6	115.4	32	179.3	147.1	82	217.9	178.8
33	25.5	20.9	83	64.1	52.6	33	102.8	84.3	83	141.4	116.0	33	180.1	147.8	83	218.7	179.5
34	26.3	21.6	84	64.9	53.3	34	103.6	85.0	84	142.2	116.7	34	180.8	148.4	84	219.5	180.1
35	27.1	22.2	85	65.7	53.9	35	104.3	85.6	85	143.0	117.3	35	181.6	149.0	85	220.2	180.7
36	27.8	22.8	86	66.5	54.0	136	105.1	86.2	186	143.7	118.0	236	182.4	149.7	286	221.0	181.4
37	28.6	23.5	87	67.2	55.2	37	105.9	86.9	87	144.5	118.6	37	183.1	150.3	87	221.8	182.0
38	29.4	24.1	88	68.0	55.8	38	106.6	87.5	88	145.3	119.2	38	183.9	150.9	88	222.6	182.6
39	30.1	24.7	89	68.8	56.4	39	107.4	88.1	89	146.1	119.9	39	184.7	151.6	89	223.3	183.3
40	31.9	25.4	90	69.6	57.1	40	108.2	88.8	90	146.8	120.5	40	185.5	152.2	90	224.1	183.9
41	31.7	26.0	91	70.3	57.7	141	109.0	89.4	191	147.6	121.1	241	186.2	152.8	291	224.9	184.5
42	32.5	26.6	92	71.1	58.3	42	109.7	90.0	92	148.4	121.8	42	187.0	153,5	92	225.6	185.2
43	33.2	27.3	93	71.9	59.0	43	110.5	90.7	93	149.1	102.4	43	187.8	154 1	93	226.4	185.8
44	34.0	27.9	94	72.6	59.6	44	111.3	91.3	94	149.9	123.0	44	188.6	154.7	94	227.2	186.4
45	34.8	28.5	95	73.4	60.2	45	112.1	92.0	95	150 7	123.7	45	189.3	155.4	95	228.0	187.1
46	35.6	29.2	96	74.2	60.9	146	112.8	92.6	196	151.5	124.3	246	190.1	156.0	296	328.7	187.7
47	36.3	29.8	97	75.0	61.5	47	113.6	93.2	79	152.2	124.9	47	190.9	156.6	97	229.5	188.3
48	37.1	30.4	98	75.7	62.1	48	114.4	93.9	98	153.0	125.6	48	191.6	157.3	98	230.3	189.0
49	37.9	31.1	99	76.5	62.8	49	115.1	94.5	99	153.8	126.2	49	192.4	157.9	99	231.1	189.6
50	38.6	31.7	100	77.3	63.4	150	115.9	95.1	200	154.6	126.8	250	193.2	158.5	300	231.8	190.2
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat.

Dist	Lat.	Dep	Dist	Lat	Dep	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep	Dist	Lat.	Dep
1	00.7	00.7	51	37.8	34.2	101	74.8	67.8	151	101.9	101.4	201	148.9	135.0	251	185.9	168.5
2	01.5	01.3	52	38.5	34.9	02	75.6	68.5	52	102.6	102.1	02	149.6	135.6	52	186.7	169.2
3	02.2	02.0	53	39.3	35.6	03	76.3	69.2	53	103.3	102.7	03	150.4	136.3	53	187.4	169.9
4	03.0	02.7	54	40.0	36.3	04	77.0	69.8	54	104.1	103.4	04	151.1	137.0	54	188.2	170.5
5	03.7	03.4	55	40.7	36.9	05	77.8	70.5	55	104.8	104.1	05	151.9	137.6	55	188.9	171.2
6	04.4	04.0	56	41.5	37.6	106	78.5	71.2	156	115.6	104.7	206	152.6	138.3	256	189.6	171.9
7	05.2	04.7	57	42 2	38.3	07	79.3	71.8	57	116.3	105.4	07	153.3	139.0	57	190.4	172,6
8	05.9	05.4	58	43.0	38.9	08	80.0	72.5	56	117.0	106.1	08	154.1	139.7	58	191.1	173.2
9	06.7	06.0	59	43.7	39.6	09	80.7	73.2	59	117.8	106.8	09	154.8	140.3	59	191.9	173.9
10	07.4	06,7	60	44.4	40,3	10	81.5	73.9	60	118.5	1074.	10	155.6	141.0	60	192.6	174.6
11	08.2	07.4	61	45 2	41.0	111	82.2	74.5	161	119.3	108.1	211	156.3	141.7	261	193.3	175.2
12	08.9	08.1	62	45.9	41.6	12	83.0	75.2	62	120,0	108.8	12	157.0	142.3	62	194.1	175.9
13	09.6	08.7	63	46.7	42.3	13	83.7	75.9	63	120.7	109.4	13	157.8	143.0	63	194.8	176.6
14	10.4	09.4	64	47.4	43.0	14	84.4	76.5	64	121.5	110.1	14	158.5	143.7	64	195.6	177.3
15	11.1	10.1	65	48,2	43.6	15	85.2	77.2	65	121.2	110.8	15	159.3	144.4	65	196.3	177.9
16	11.9	10.7	66	48.9	44.3	116	85.9	77.9	166	123.0	111.5	216	160.0	145.0	266	197.0	178.6
17	12.6	11.4	67	49.6	45.0	17	86.7	78.6	67	123.7	112.1	17	160.7	145.7	67	197.8	179.3
18	13.5	12,1	68	50.4	45.7	18	87.4	79.2	68	124.4	112.8	18	161.5	146.4	68	198.5	179.9
19	14.1	12.8	69	51.1	46.3	19	88.2	79,9	69	125.2	113.5	19	162.2	147.0	69	199.3	180.6
20	14.8	13.4	70	51.9	47.0	20	88,9	80.6	70	125.9	114.1	20	163.0	147.7	70	200.0	181.3
21	15.6	14.1	71	52.6	47.7	121	89.6	81.2	171	126.7	114.8	221	163.7	148.4	271	200.7	182.9
22	16.3	14.8	72	53.3	48.3	22	90.4	81.9	72	127.4	115.5	22	164.4	149.1	72	201.5	182.6
23	17.0	15.4	73	54.1	49.0	23	91.1	82.6	73	128.2	116.2	23	165.2	149.7	73	202.2	183.3
24	17.8	16.1	74	54.8	49.7	24	91.9	83.3	74	128.9	116.8	24	165.9	150.4	74	203.0	184.0
25	18.5	16.8	75	55.6	50.4	25	92.6	83.9	75	129.6	117.5	25	166.7	151.1	75	203.7	184.6
26	19.3	17.5	76	56.3	51.0	126	93.3	84.6	176	130.4	118.2	226	167.4	151.7	276	204.4	185.3
27	20.0	18.1	77	57.0	51.7	27	94.1	85.3	77	131,1	118.8	27	168.2	152.4	77	205.2	186.0
28	20.7	18.8	78	57.8	52.4	28	94.8	85.9	78	131.9	119.5	28	168.9	153.1	78	205.9	186.7
29	21.5	19.5	79	58.5	53.0	29	95.6	86.6	79	132.6	120.2	29	169.6	153.8	79	206.7	187.3
30	22.2	20.1	80	59.3	53.7	30	96.3	87.3	80	133.3	120.9	30	170.4	154.4	80	207.4	188.0
31	23.0	20.8	81	60.0	54.4	131	97.0	88.6	181	134.1	121.5	231	171.1	155.1	281	208.2	188.7
32	23.7	21.5	82	60.7	55.1	32	97.8	88.0	82	134.8	122.2	32	171.9	155.8	82	208.9	189.3
33	24.4	22.2	83	61.5	55.7	33	98.5	89.6	83	135.6	122.9	33	172.6	156.4	83	209.6	190.0
34	25.2	22.8	84	62.2	56.4	34	99,3	90.3	84	136.3	123.5	34	173.3	157.1	84	210.4	190.7
35	25.9	23.5	85	63.0	57.1	35	100.0	90.0	85	137.0	124.2	35	174.1	157.8	85	211.1	191.4
36	26.7	24.2	86	63.7	57.7	136	100.7	91.7	186	137.8	124.9	236	174.8	158.5	286	211.9	192.0
37	27.4	24.8	87	64.4	58.4	37	101.5	92.3	87	138.5	125.6	37	175.6	159.8	87	212.6	192.7
38	28.2	25.5	88	65,2	59.1	38	102.2	92.0	88	139.3	126.2	38	176.3	159.1	88	213.3	193.4
39	28.9	26.2	89	65.9	59.8	39	103.0	93.7	89	140.0	126.9	39	177.0	160.5	89	214.1	194.0
40	29.6	26,9	90	66.4	60.4	40	103.7	94.4	90	140.7	127.6	40	177.8	161.1	90	214.8	184.7
41	30.4	27.5	91	67.4	61.1	141	104.5	94.4	191	141.5	128.2	241	178.5	161.8	291	215.6	195.4
42	31.1	28.2	92	68.2	61.8	42	105.2	95.3	92	142.2	128.9	42	179.3	162.5	92	216.3	196.1
43	31.9	28.9	93	68.9	62.4	43	105.9	96.0	93	143.0	129.6	43	180.0	163.2	93	217.0	196.7
44	32.6	29,5	94	69.6	63.1	44	106.7	96.7	94	143.7	130.3	44	180.7	163.8	94	217.8	197.4
45	33.3	30.2	95	70.4	63.8	45	107.4	97.4	95	144.4	130.9	45	181.5	164.5	95	218.5	198.1
46	34.1	30.9	96	71.1	64.5	146	108.2	98.0	196	145.2	131.6	246	182.2	165.2	296	219.3	198.7
47	34.8	31.6	97	71.9	65.1	47	108.9	98.7	97	145.9	132.3	47	183.0	165.8	97	220.0	199.4
48	35.6	32.2	98	72.6	65.8	48	109.6	99.4	98	146.7	132.9	48	183.7	166.5	98	220.7	200.1
49	36.3	32.9	99	73.3	66.5	49	110.4	100.0	99	147.4	133.6	49	184.4	167.2	99	221.5	200.8
50	37.0	33.6	100	74.1	67.1	150	111.1	100.7	200	148.2	134.3	250	185.2	167.9	300	222.2	201.4
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat	Dist	Dep	Lat

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.7	00.7	51	36.1	36.1	101	71.4	71.4	151	106.8	106.8	201	142.1	142.1	251	177.5	177.5
2	01.4	01.4	52	36.8	36.8	02	72.1	72.1	52	107.5	107.5	02	142.8	142.8	52	178.2	178.2
3	02.1	02.1	53	37.5	37.5	03	72.8	72.8	53	108.2	108.2	03	143.5	143.5	53	178.9	178.9
4	02.8	02.8	54	38.2	38.2	04	73.5	33.5	54	108.9	108.9	04	144.2	144.2	54	179.6	179.6
5	03.5	03.5	55	38.9	38.9	05	74.2	74.2	55	109.6	109.6	05	144.9	144.9	55	180.3	180.3
6	04.2	04.2	56	39.6	39.6	106	74.9	74.9	156	110.3	110,3	206	145.7	145.7	256	181 0	181.0
7	04.9	04.9	57	40.3	40.3	07	75.7	75.7	57	111.0	111.0	07	146.4	146.4	57	181.7	181.7
8	05.7	05.7	58	41.0	41.0	08	76.4	76.4	58	111.7	111.7	08	147.1	147.1	58	182.4	182.4
9	06.4	06.4	59	41.7	41.7	09	77.1	77.1	59	112.4	112.4	09	147.8	147.8	59	183.1	183.1
10	07.1	07.1	60	42.4	42.4	10	77.8	77.8	60	113.1	113.1	10	148.5	148.5	60	183.8	183.8
11	07.8	07.8	61	43.1	43.1	111	78.5	78.5	161	113.8	113.8	211	149.2	149.2	261	184.5	184.5
12	08.5	08.5	62	43.8	43.8	12	79.2	79.2	62	114.5	114.5	12	149.9	149.9	62	185.3	185.3
13	09.2	09.2	63	44.5	44.5	13	79.9	79.9	63	115.3	115.3	13	150.6	150.6	63	186.0	186.0
14	09.9	09.9	64	45.3	45.3	14	80.6	80.6	64	116.0	116.0	14	151.3	151.3	64	186.7	186.7
15	10.6	10.6	65	46.1	46.1	15	81.3	81,3	65	116.7	116.7	15	152.0	152.0	65	187.4	187.4
16	11.3	11.3	66	46.7	46.4	116	82.0	82.0	166	117.4	117.4	216	152.7	152.7	266	188.1	188.1
17	12.0	12.0	67	47.4	47.4	17	82.4	82.4	67	118.1	118.1	17	153.4	153.4	67	188.8	188.8
18	12.4	12.7	68	48.1	48.1	18	83.7	83.7	68	118.8	118.8	18	154.1	154.1	68	189.5	189.5
19	13.7	13.4	69	48.8	48.8	19	84.1	84.1	69	119.5	119.5	19	154.8	154.8	69	190.2	190.2
20	14.1	14.1	70	49.5	49.5	20	84.8	84.8	70	120.2	120.2	20	155.6	155.6	70	190.9	190.9
21	14.8	14.8	71	50.2	50.2	121	85.6	85.6	171	120.9	120.9	221	156.3	156.3	271	191.6	191.6
22	15.6	15.6	72	50.9	50.9	22	86.3	86.3	72	121.6	121.6	22	157.0	157.0	72	192.3	192.3
23	16.3	16.3	73	51.6	51.6	23	87.0	87.0	73	122.3	122.3	23	157.7	157.7	73	193.0	193.0
24	17.0	17.0	74	52.3	52.3	24	87,7	87.7	74	123.0	123.0	24	158.4	158.4	74	193.7	193.7
25	17.7	17.7	75	53.0	53.0	25	88.4	88,4	75	123.7	123.7	25	159.1	159.1	75	194.4	194.4
26	18,4	18.4	76	53.7	53.7	126	89.1	89.1	176	124.4	124.4	226	159.8	159.8	276	155.2	195.2
27	19.1	19.1	77	54.4	54 4	27	89.8	89.8	77	125.2	125.2	27	160.5	160.5	77	195.9	195.9
28	19.8	19.8	78	55.2	55.2	28	90.5	90.5	78	125.9	125.9	28	161.2	161.2	78	196.6	196.6
29	20.5	20.5	79	55,9	55.9	29	91.2	91.2	79	126.6	126.6	29	161.9	161.9	79	197.3	197.3
30	21.2	21.2	80	56.6	56.6	30	91.9	91.9	80	127.3	127,3	30	162.6	162.6	80	198.0	198.0
31	21.9	21.9	81	57.3	57.3	131	92.6	12.6	181	128.0	128.0	231	163.3	163.3	281	198.7	198.7
32	22.3	22.3	82	58.0	58.0	32	93.3	93.3	82	128.7	128.7	32	164.0	164.0	82	199.4	199.4
33	23 6	23.6	83	58.7	58.7	33	94.0	94.0	83	129.4	129.4	33	164.7	164.7	83	200.1	200.1
34	24.0	24.0	84	59.4	59.4	34	94 7	94.7	84	130.1	130.1	34	165.5	165.5	84	200.8	200.8
35	24.7	24.7	85	60.1	60.1	35	95,5	95.5	85	130.8	130.8	35	166.2	166.2	85	201.5	201.5
36	25.5	25.5	86	60.8	60 8	136	96.2	96.2	186	131.5	131.5	236	166.9	166.9	286	202.2	202 2
37	26.2	26.2	87	61,5	61.5	37	96.9	96.9	87	132.2	132.2	37	167.6	167.6	87	202.9	202.9
38	26.9	26.9	88	62.2	62.2	38	97.6	97.6	88	132.9	132.9	38	168.3	168.3	88	203.6	203.6
39	27 6	27.6	89	62.9	62.9	39	98.3	98.3	89	133.6	133.6	39	169.0	169.0	89	204.3	204.3
40	28.3	28.3	90	63.6	63.6	40	99.0	99.0	90	134.3	134.3	40	169.7	169,7	90	205.1	205.1
41	29.0	29.0	91	64.3	64.3	141	99,7	99.7	191	135.1	135.1	241	170.4	170.4	291	205.8	295.8
42	29.7	29.7	92	65.1	65.1	42	100.4	100.4	92	135.8	135.8	42	171.1	171.1	92	206.5	206.5
43	30.4	30.4	93	65.8	65.8	43	101.1	101.1	93	136.5	136.5	43	171.8	171.8	93	207.2	207.2
44	31.1	31.1	94	66.5	66.5	44	101.8	101.8	94	137.2	137.2	44	172.5	172.5	94	207.9	207.9
45	31.8	31.8	95	67.2	67.2	45	102.5	102.5	95	137.9	137.9	45	173.2	173,2	95	208.6	208.6
46	32.5	32.5	96	67.9	67.9	146	103.2	103.2	196	138.6	138.6	246	173.9	173.9	296	209.3	209.3
47	33.2	33.2	97	68.6	68.6	47	103.9	103.9	97	139.3	139.3	47	174.6	174.6	97	210.0	210.0
48	34.9	33.9	98	79.3	69.3	48	104.6	104.6	98	140.0	140.0	48	175.4	175.4	98	210.7	210.7
49	34.6	34.6	99	70.0	70.0	49	105.4	105.4	99	140.7	140.2	49	176.1	176.1	99	211.4	211.4
50	35.4	35.4	100	70.7	70,7	50	106.1	106.1	200	141.4	141.4	50	176.8	176.8	300	212.1	212.1
Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat	Dist	Dep	Lat

A TABLE of Numbers for the readier finding the Time of High-Water on any Day.

Month Days	Year 1774.											
	January	February	March	April	May	June	July	August	September	October	November	December
1	29	30	29	30	30	32	32	34	35	35	37	38
2	30	31	30	31	31	33	33	35	36	36	38	39
3	31	32	31	32	32	34	34	36	37	37	39	40
4	32	33	32	33	33	35	35	37	38	38	40	11
5	33	34	33	34	34	36	36	38	39	39	11	12
6	34	35	34	35	35	37	37	39	40	40	12	13
7	35	36	35	36	36	38	38	40	11	11	13	14
8	36	37	36	37	37	39	39	11	12	12	14	15
9	37	38	37	38	38	40	40	12	13	13	15	16
10	38	39	38	39	39	11	11	13	14	14	16	17
11	39	40	39	40	40	12	12	14	15	15	17	18
12	40	11	40	11	11	13	13	15	16	16	18	19
13	11	12	11	12	12	14	14	16	17	17	19	20
14	12	13	12	13	13	15	15	17	18	18	20	21
15	13	14	13	14	14	16	16	18	19	19	21	22
16	14	15	14	15	15	17	17	19	20	20	22	23
17	15	16	15	16	16	18	18	20	21	21	23	24
18	16	17	16	17	17	19	19	21	22	22	24	25
19	17	18	17	18	18	20	20	22	23	23	25	26
20	18	19	18	19	19	21	21	23	24	24	26	27
21	19	20	19	20	20	22	22	24	25	25	27	28
22	20	21	20	21	21	23	23	25	26	26	28	29
23	21	22	21	22	22	24	24	26	27	27	29	30
24	22	23	22	23	23	25	25	27	28	28	30	31
25	23	24	23	24	24	26	26	28	29	29	31	32
26	24	25	24	25	25	27	27	29	30	30	32	33
27	25	26	25	26	26	28	28	30	31	31	33	34
28	26	27	26	27	27	29	29	31	32	32	34	35
29	27		27	28	28	30	30	32	33	33	35	36
30	28		28	29	29	31	31	33	34	34	36	37
31	29		29		30		32	34		35		38

Month Days	Year 1775.											
	January	February	March	April	May	June	July	August	September	October	November	December
1	39	11	40	11	12	13	14	15	17	17	19	19
2	40	12	11	12	13	14	15	16	18	18	20	20
3	11	13	12	13	14	15	16	17	19	19	21	21
4	12	14	13	14	15	16	17	18	20	20	22	22
5	13	15	14	15	16	17	18	19	21	21	23	23
6	14	16	15	16	17	18	19	20	22	22	24	24
7	15	17	16	17	18	19	20	21	23	23	25	25
8	16	18	17	18	19	20	21	22	24	24	26	26
9	17	19	18	19	20	21	22	23	25	25	27	27
10	18	20	19	20	21	22	23	24	26	26	28	28
11	19	21	20	21	22	23	24	25	27	27	29	29
12	20	22	21	22	23	24	25	26	28	28	30	30
13	21	23	22	23	24	25	26	27	29	29	31	31
14	22	24	23	24	25	26	27	28	30	30	32	32
15	23	25	24	25	26	27	28	39	31	31	33	33
16	24	26	25	26	27	28	29	30	32	32	34	34
17	25	27	26	27	28	29	30	31	33	33	35	35
18	26	28	27	28	29	30	31	32	34	34	36	36
19	27	29	28	29	30	31	32	33	35	35	37	37
20	28	30	29	30	31	32	33	34	36	36	38	38
21	29	31	30	31	32	33	34	35	37	37	39	39
22	30	32	31	32	33	34	35	36	38	38	40	40
23	31	33	32	33	34	35	36	37	39	39	11	11
24	32	34	33	34	35	36	37	38	40	40	12	12
25	33	35	34	35	36	37	38	39	11	11	13	13
26	34	36	35	36	37	38	39	40	12	12	14	14
27	35	37	36	37	38	39	40	11	13	13	15	15
28	36	38	37	38	39	40	11	12	14	14	16	16
29	37		38	39	40	11	12	13	15	15	17	17
30	38		39	40	11	12	13	14	16	16	18	18
31	39		40		12		14	15		17		19

A TABLE of Numbers for the readier finding the Time of High-Water on any Day.

Month Days	Year 1776.											
	January	February	March	April	May	June	July	August	September	October	November	December
1	20	22	21	22	23	24	25	26	28	28	30	30
2	21	23	22	23	24	25	26	27	29	29	31	31
3	22	24	23	24	25	26	27	28	30	30	32	32
4	23	25	24	25	26	27	28	29	31	31	33	33
5	24	26	25	26	27	28	29	30	32	32	34	34
6	25	27	26	27	28	29	30	31	33	33	35	35
7	26	28	27	28	29	30	31	32	34	34	36	36
8	27	29	28	29	30	31	32	33	35	35	37	37
9	28	30	29	30	31	32	33	34	36	36	38	38
10	29	31	30	31	32	33	34	35	37	37	39	39
11	30	32	31	32	33	34	35	36	38	38	40	40
12	31	33	32	33	34	35	36	37	39	39	11	11
13	32	34	33	34	35	36	37	38	40	40	12	12
14	33	35	34	35	36	37	38	39	11	11	13	13
15	34	36	35	36	37	38	39	40	12	12	14	14
16	35	37	36	37	38	39	40	11	13	13	15	15
17	36	38	37	38	39	40	11	12	14	14	16	16
18	37	39	38	39	40	11	12	13	15	15	17	17
19	38	40	39	40	11	12	13	14	16	16	18	18
20	39	11	40	11	12	13	14	15	17	17	19	19
21	40	12	11	12	13	14	15	16	18	18	20	20
22	11	13	12	13	14	15	16	17	19	19	21	21
23	12	14	13	14	15	16	17	18	20	20	22	22
24	13	15	14	15	16	17	18	19	21	21	23	23
25	14	16	15	16	17	18	19	20	22	22	24	24
26	15	17	16	17	18	19	20	21	23	23	25	25
27	16	18	17	18	19	20	21	22	24	24	26	26
28	17	19	18	19	20	21	22	23	25	25	27	27
29	18	20	19	20	21	22	23	24	26	26	28	28
30	19		20	21	22	23	24	25	27	27	29	29
31	20		21		23		25	26		28		

Months Days	Year 1777.											
	January	February	March	April	May	June	July	August	September	October	November	December
1	31	33	32	33	34	35	36	37	39	39	11	11
2	32	34	33	34	35	36	37	38	40	40	12	12
3	33	35	34	35	36	37	38	39	11	11	13	13
4	34	36	35	36	37	38	39	40	12	12	14	14
5	35	37	36	37	38	39	40	11	13	13	15	15
6	36	38	37	38	39	40	11	12	14	14	16	16
7	37	39	38	39	40	11	12	13	15	15	17	17
8	38	40	39	40	11	12	13	14	16	16	18	18
9	39	11	40	11	12	13	14	15	17	17	19	19
10	40	12	11	12	13	14	15	16	18	18	20	20
11	11	13	12	13	14	15	16	17	19	19	21	21
12	12	14	13	14	15	16	17	18	20	20	22	22
13	13	15	14	15	16	17	18	19	21	21	23	23
14	14	16	15	16	17	18	19	20	22	22	24	24
15	15	17	16	17	18	19	20	21	23	23	25	25
16	16	18	17	18	19	20	21	22	24	24	26	26
17	17	19	18	19	20	21	22	23	25	25	27	27
18	18	20	19	20	21	22	23	24	26	26	28	28
19	19	21	20	21	22	23	24	25	27	27	29	29
20	20	22	21	22	23	24	25	26	28	28	30	30
21	21	23	22	23	24	25	26	27	29	29	31	31
22	22	24	23	24	25	26	27	28	30	30	32	32
23	23	25	24	25	26	27	28	29	31	31	33	33
24	24	26	25	26	27	28	29	30	32	32	34	34
25	25	27	26	27	28	29	30	31	33	33	35	35
26	26	28	27	28	29	30	31	32	34	34	36	36
27	27	29	28	29	30	31	32	33	35	35	37	37
28	28	30	29	30	31	32	33	34	36	36	38	38
29	29		30	31	32	33	34	35	37	37	39	39
30	30		31	32	33	34	35	36	38	38	40	40
31	31		32		34		36	37		39		11

A TABLE of Numbers for the readier finding the Time of High-Water on any Day.

Month Days	Year 1778.												
	January	February	March	April	May	June	July	August	September	October	November	December	
1	12	14	13	14	15	16	17	18	20	20	22	22	
2	13	15	14	15	16	17	18	19	21	21	23	23	
3	14	16	15	16	17	18	19	20	22	22	24	24	
4	15	17	16	17	18	19	20	21	23	23	25	25	
5	16	18	17	18	19	20	21	22	24	24	26	26	
6	17	19	18	19	20	21	22	23	25	25	27	27	
7	18	20	19	20	21	22	23	24	26	26	28	28	
8	19	21	20	21	22	23	24	25	27	27	29	29	
9	20	22	21	22	23	24	25	26	28	28	30	30	
10	21	23	22	23	24	25	26	27	29	29	31	31	
11	22	24	23	24	25	26	27	28	30	30	32	32	
12	23	25	24	25	26	27	28	29	31	31	33	33	
13	24	26	25	26	27	28	29	30	32	32	34	34	
14	25	27	26	27	28	29	30	31	33	33	35	35	
15	26	28	27	28	29	30	31	32	34	34	36	36	
16	27	29	28	29	30	31	32	33	35	35	37	37	
17	28	30	29	30	31	32	33	34	36	36	38	38	
18	29	31	30	31	32	33	34	35	37	37	39	39	
19	30	32	31	32	33	34	35	36	38	38	40	40	
20	31	33	32	33	34	35	36	37	39	39	11	11	
21	32	34	33	34	35	36	37	38	40	40	12	12	
22	33	35	34	35	36	37	38	39	11	11	13	13	
23	34	36	35	36	37	38	39	40	12	12	14	14	
24	35	37	36	37	38	39	40	11	13	13	15	15	
25	36	38	37	38	39	40	11	12	14	14	16	16	
26	37	39	38	39	40	11	12	13	15	15	17	17	
27	38	40	39	40	11	12	13	14	16	16	18	18	
28	39	11	40	11	12	13	14	15	17	17	19	19	
29	40		11	12	13	14	15	16	18	18	20	20	
30	11		12	13	14	15		17	19	19	21	21	
31	12		13		15			18		20		22	

Months Days	Year 1779.												
	January	February	March	April	May	June	July	August	September	October	November	December	
1	23	25	24	25	26	27	28	29	31	31	33	33	
2	24	26	25	26	27	28	29	30	32	32	34	34	
3	25	27	26	27	28	29	30	31	33	33	35	35	
4	26	28	27	28	29	30	31	32	34	34	36	36	
5	27	29	28	29	30	31	32	33	35	35	37	37	
6	28	30	29	30	31	32	33	34	36	36	38	38	
7	29	31	30	31	32	33	34	35	37	37	39	39	
8	30	32	31	32	33	34	35	36	38	38	40	40	
9	31	33	32	33	34	35	36	37	39	39	11	11	
10	32	34	33	34	35	36	37	38	40	40	12	12	
11	33	35	34	35	36	37	38	39	11	11	13	13	
12	34	36	35	36	37	38	39	40	12	12	14	14	
13	35	37	36	37	38	39	40	11	13	13	15	15	
14	36	38	37	38	39	40	11	12	14	14	16	16	
15	37	39	38	39	40	11	12	13	15	15	17	17	
16	38	40	39	40	11	12	13	14	16	16	18	18	
17	39	11	40	11	12	13	14	15	17	17	19	19	
18	40	12	11	12	13	14	15	16	18	18	20	20	
19	11	13	12	13	14	15	16	17	19	19	21	21	
20	12	14	13	14	15	16	17	18	20	20	22	22	
21	13	15	14	15	16	17	18	19	21	21	23	23	
22	14	16	15	16	17	18	19	20	22	22	24	24	
23	15	17	16	17	18	19	20	21	23	23	25	25	
24	16	18	17	18	19	20	21	22	24	24	26	26	
25	17	19	18	19	20	21	22	23	25	25	27	27	
26	18	20	19	20	21	22	23	24	26	26	28	28	
27	19	21	20	21	22	23	24	25	27	27	29	29	
28	20	22	21	22	23	24	25	26	28	28	30	30	
29	21		22	23	24	25	26	27	29	29	31	31	
30	22		23	24	25	26	27	28	30	30	32	32	
31	23		24		26		28	29		31		33	

A TABLE of Numbers for the readier finding the Time of High-Water on any Day.

Year 1780.

Month Days	January	February	March	April	May	June	July	August	September	October	November	December
1	34	36	35	36	37	38	39	11	13	13	15	15
2	35	37	36	37	38	39	40	12	14	14	16	16
3	36	38	37	38	39	40	11	13	15	15	17	17
4	37	39	38	39	40	11	12	14	16	6	18	18
5	38	40	39	40	11	12	13	15	17	17	19	19
6	39	11	40	1	12	13	14	16	18	18	20	20
7	40	12	11	12	13	14	15	17	19	19	21	2
8	11	13	12	13	14	15	16	18	20	20	22	22
9	12	14	13	14	15	16	17	19	21	21	23	23
10	13	15	14	15	16	17	18	20	22	22	24	24
11	14	16	15	16	17	18	19	21	23	23	25	25
12	15	17	16	17	18	19	20	22	24	24	26	26
13	16	18	17	18	19	20	21	23	25	25	27	27
14	17	19	18	19	20	21	22	24	26	26	28	28
15	18	20	19	20	21	22	23	25	27	27	29	29
16	19	21	2	21	22	23	24	26	28	28	30	30
17	20	22	21	22	23	24	25	27	29	29	31	31
18	21	23	22	23	24	25	26	28	30	30	32	32
19	22	24	23	24	25	26	27	29	31	31	33	33
20	23	25	24	25	26	27	28	30	32	32	34	34
21	24	26	25	26	27	28	29	31	33	33	35	35
22	25	27	26	27	28	29	30	32	34	34	36	36
23	26	28	27	28	29	30	31	33	35	35	37	37
24	27	29	28	29	30	31	32	34	36	36	38	38
25	28	30	29	30	31	32	33	35	37	37	39	35
26	29	31	30	31	32	33	34	36	38	38	40	40
27	30	32	31	32	33	34	35	37	39	39	11	11
28	31	33	32	33	34	35	36	38	40	40	12	12
29	32	34	33	34	35	36	37	39	11	11	13	13
30	33		34	35	36	37	38	40	12	12	14	14
31	34		35		37		39	11		13		

Year 1781.

Month Days	January	February	March	April	May	June	July	August	September	October	November	December
1	15	17	16	17	18	19	20	21	23	23	25	25
2	16	18	17	18	19	20	21	22	24	24	26	26
3	17	19	18	19	20	21	22	23	25	25	27	27
4	18	20	19	20	21	22	23	24	26	26	28	28
5	19	21	20	21	22	23	24	25	27	27	29	29
6	20	22	21	22	23	24	25	26	28	28	30	30
7	21	23	22	23	24	25	26	27	29	29	31	31
8	22	24	23	24	25	26	27	28	30	30	32	32
9	23	25	24	25	26	27	28	39	31	31	33	33
10	24	26	25	26	27	28	29	30	32	32	34	34
11	25	27	26	27	28	29	30	31	33	33	35	35
12	26	28	27	28	29	30	31	32	34	34	36	36
13	27	29	28	29	30	31	32	33	35	35	37	37
14	28	30	29	30	31	32	33	34	36	36	38	38
15	29	31	30	31	32	33	34	35	37	37	39	39
16	30	32	31	32	33	34	35	36	38	38	40	40
17	31	33	32	33	34	35	36	37	39	3	11	11
18	32	34	33	34	35	36	37	38	40	40	12	12
19	33	35	34	35	36	37	38	39	11	11	13	13
20	34	36	35	36	37	38	39	40	12	12	14	14
21	35	37	36	37	38	39	40	11	13	13	15	15
22	36	38	37	38	39	40	11	12	14	14	16	16
23	37	39	38	39	40	41	12	13	15	15	17	17
24	38	40	39	40	11	42	1	14	16	16	18	18
25	39	11	40	11	12	43	14	15	17	17	19	19
26	40	12	11	12	13	44	15	16	18	18	20	20
27	11	13	12	13	14	45	16	17	19	19	21	21
28	12	14	13	14	15	46	17	18	20	20	22	22
29	13		14	15	16	47	18	19	21	21	23	23
30	14		15	16	17	48	19	20	22	22	24	24
31	15				18	49	20	21		23		25

A TABLE of Numbers, &c.

Year 1782.

Months Days	January	February	March	April	May	June	July	August	September	October	November	December
1	26	28	27	28	29	30	31	32	34	34	36	36
2	27	29	28	29	30	31	32	33	35	35	37	37
3	28	30	29	30	31	32	33	34	36	36	38	38
4	29	31	30	31	32	33	34	35	37	37	39	39
5	30	32	31	32	33	34	35	36	38	38	40	40
6	31	33	32	33	34	35	36	37	39	39	11	11
7	32	34	33	34	35	36	37	38	40	40	12	12
8	33	35	34	35	36	37	38	39	11	11	13	13
9	34	36	35	36	37	38	39	40	12	12	14	14
10	35	37	36	37	38	39	40	11	13	13	15	15
11	36	38	37	38	39	40	11	12	14	14	16	16
12	37	39	38	39	40	11	12	13	15	15	17	17
13	38	40	39	40	11	12	13	14	16	16	18	18
14	39	11	40	11	12	13	14	15	17	17	19	19
15	40	12	11	12	13	14	15	16	18	18	20	20
16	11	13	12	13	14	15	16	17	19	19	21	21
17	12	14	13	14	15	16	17	18	20	20	22	22
18	13	15	14	15	16	17	18	19	21	21	23	23
19	14	16	15	16	17	18	19	20	22	22	24	24
20	15	17	16	17	18	19	20	21	23	23	25	25
21	16	18	17	18	19	20	21	22	24	24	26	26
22	17	19	18	19	20	21	22	23	25	25	27	27
23	18	20	19	20	21	22	23	24	26	26	28	28
24	19	21	20	21	22	23	24	25	27	27	29	29
25	20	22	21	22	23	24	25	26	28	28	30	30
26	21	23	22	23	24	25	26	27	29	29	31	31
27	22	24	23	24	25	26	27	28	30	30	32	32
28	23	25	24	25	26	27	28	29	31	31	33	33
29	24	26	25	26	27	28	29	30	32	32	34	34
30	25		26	27	28	29	30	31	33	33	35	35
31	26		27		29		31	32		34		36

A TABLE answering to any of the foregoing Numbers.

Numbers.	Times answering H.	M.	
11	0	48	Afternoon
12	1	36	
13	2	24	
14	3	12	
15	4	00	
16	4	48	
17	5	36	
18	6	24	
19	7	12	
20	8	00	
21	8	48	
22	9	36	
23	10	24	
24	11	12	
25	12	00	
26	0	48	After Midnight
27	1	36	
28	2	24	
29	3	12	
30	4	00	
31	4	48	
32	5	36	
33	6	24	
34	7	12	
35	8	00	
36	8	48	
37	9	36	
38	10	24	
39	11	12	
40	12	00	

The Uſe of the foregoing Tables of Numbers.

IN theſe Tables each Page is divided into two Parts, by a black Line drawn down the Middle; and each of the Parts are marked at the Top with the Year for which they ſhew the Numbers; and under that, the Left-hand Column of each Part is marked with the Days of the Month, and the other Columns with the Months of the Year: So that if you would know the Number for any Day, ſuppoſe, for Example, on the 26th of *March*, 1776.

Firſt, Find the given Year 1776 at the Top of the Table, and then under the given Month, which is *March*, and right againſt the given Day of the Month (which in this Caſe is 26) you will find the Number 16, which is the Number for that Day; and if from the Number ſo found you ſubtract 10, the Remainder will be the Moon's Age for that Day.

The Uſe of the Table of the Times, anſwering to the foregoing Numbers.

In this Table the Left-hand Column is marked with the given Numbers from 11 to 40, and the Figures right againſt any of theſe Numbers, give the Time anſwering to it in Hours and Minutes.

EXAMPLE I.

I would know what Time anſwers to the Number 23?

Anſwer. 10 Hours 24 Minutes Afternoon, that is, at 24 Minutes paſt 10 at Night.

EXAMPLE II.

What Number and Time anſwers to the 8th of January, 1776.

Firſt, By the Tables of Numbers I find the Number to be 27, and againſt that Number, in the Table of Times, I find 1 Hour 36 Minutes after Midnight, that is, 36 Minutes paſt One in the Morning.

A.	H	M
At *Army*	01	03
At *Amsterdam* and *Armentie*	03	00
At *Abarwark*	04	30
At *Abermorick* and *Antwerk*	06	00
At *Aldborough*	09	45
B.		
At *Beachy*, *Blacktail*, and before the Race of *Blanquet*	12	00
Thwart of *Beachy*	12	45
At *Blackness* in *Bluet*, and at *Bell-Isle*	01	30
Without *Bluet*, and at *Berwick*	02	15
Bourdeaux River, the South Coast of *Bretaigne* the Coast of *Biscay*, and at *Backness*	03	00
At *Brest*, before the *Base*, and the River of *Bourdeaux* within the Haven	03	45
In *Breescund*, *Bloy*, and *Baltimore*	04	30
Before *Bremen* and at *Blackney*, and in the Channel before *Bourdeaux*	06	00
At *Bristol* Key	06	45
At *Bridgewater*	07	30
Bullen Deep	10	30
C.		
In *Condado*	12	00
In the Chamber of *Rye*	00	45
Without *Calis*, at *Corpus Christi* Point, and at *Camfer*	01	30
Between *Calis* and *Dover*, before *Conquet*, and at the North Cape	03	00
At *Cork*, *Calis*, Cape *Clear*, and in the *Creek*	04	30
At *Caldy* and *Comarthen Bay*	05	15
At *Concalo*	06	00
Without the *Caskets*	08	15
Between the *Caskets* and *Guernsey*, before *Cromer* and *Seven Cliffs*, and at *Catness*	09	00
At the *Caskets* and at *Chamberness*	09	45
At *Cows*, in the Fos of *Caen*, in *Calice* and *Chamberness* Roads	10	30
Before the Haven of *Caen*, in the *Chamber*, between *Cripple Sand* and the *Croyle* and at *Calshot*	11	15
D.		
At *Dover* Pier, and before *Dunkirk*	12	00
At *Denbeigh*, and at *Downs* Road	02	15
At *Dort*	03	00
At *Dungarven*	04	30
At *Dartmouth*	06	00
At *Dublin*	08	15
At *Dunbar*	09	00
At *Dungeness* and *Dunnose*	09	45
At *Dover*, *Dieppe*, and *Deal*	10	30
E.		
At *Emden*, before the *Elve*, before the *Eyder*, and before *Enchusen*	12	00
At *Edam*	01	30
Before the Eastern and Western *Emes*, and at *Engomonts*	09	00

F.	H	M
On the Coaſt of *Flanders*	12	00
At *Fluſhing*	00	45
Before the *Fen* in the Channel	01	30
Without *Fountny*	02	15
Without the Banks of *Flanders*	03	00
At *Flamborough* and *Bridlington*	04	30
At the *Forn*, in *Foy*, at *Falmouth*	05	15
Between *Foy* & *Falmouth*, in the Channel, and at *Foulneſs*	06	45
Before the Coaſt of *Friezeland*, and the *Fly*	07	30
Without the *Fly*	08	15
At *Frieze* and *Fair Iſle*	09	00
At the *Frith* and South *Foreland*	10	30
In the *Fair Iſle* Road, and at the North *Foreland*	11	15

G.		
In *Gibralter* Road, *Gravelling*, and before *Cherburg*	12	00
Before *Goree*, at *Guernſey*, and at *Graveſend*	01	30
At *Groine*, at *Gaſcoign*, and the Coaſt of *Galicia*	03	00
Thwart of *Guernſey*	09	45
In the *Chamber*, and *Goree end*	11	15

H.		
Before the *Hever*, before *Horn*, and at *Hampton-Key*	12	00
Under *Holy Iſland*, & at *Horn*	01	30
Before *Hartlepoole*	03	00
At *Huntcliff-Foot*	03	45
At *Humber*	05	15
Before *Hamborough*, at *Hull*, at the *Holmes*, and before *Humber*'s Mouth	06	00
At *Haerlem*, *Havre de Grace*, and *Home-head*	09	00
At St. *Helens*, and *Harwich*, and without the Banks of *Harwich*	10	30
At *Harwich* within	11	15

I.		
At *Jutland* Iſlands	12	00
On the W. Coaſt of *Ireland*	03	09
In all the Havens on the South Coaſt of *Ireland*	05	15

K.		
Kentiſh Knock	12	00
At *Kelliers*	03	00
At *Kingſale*	04	30
At *Kilduyn*	07	30
At *Kildive*	09	00

L.		
At *Leith*	12	00
At *Liſbon*	02	15
At *London*	03	00
Thwart of *Londey*, and before *Lynn*	05	15
At *Lynn* Half-tide, at *Londey*	06	00
At *Lynn*	06	45

	H	M
At the *Lizard* by the Land	07	30
At *Lambay*	08	15
At *Leyſtoff* and thwart off it without the Banks	09	45
In *Leyſtoff* Road, and at *Long Sand Head*	10	30
M		
Within the *Maes* at *Maldon*	00	45
Before the *Maes*	01	30
At the *Maes*, and before *St. Matthew*'s Point	03	45
In *Mouſe-Hole*, at *St. Matthew*'s, and within *Mount*'s-*Bay*	04	30
In *Milford*, at *Moonleſs*, and at *St. Maloes*	05	15
Between *Mouſe-Hole* and *Falmouth*, and in *Milford Haven*	07	30
In *St. Magnes* Sound, and *Magnes* Caſtle	08	15
At the Iſle of *Man*	09	00
Before *Margate*	11	15
N		
At *Newport* Half Tide	12	00
At the Weſt End of the *Nore*	00	45
Before *Nantz* River	03	00
At *Newcaſtle*	05	15
Before *St. Nicholas*	06	45
At the *Needles*, at the Iſle of *Wight*	08	15
All the Coaſt of *Normandy* and *Picardy*	10	30
Between the *Naze* and *Warhead* of *Lower*	11	15

	H	M
O		
At *Orkneſs*	03	00
At *Orkney*	09	00
At *Orfordneſs*	09	45
At *Orfordneſs* without the Banks, and between *Orford* and *Orwell Waves*	10	30
At *Orfordneſs* within the Sands	11	15
P		
At *Portſmouth* Half Tide	11	15
At the *Pens*, *Porthus*, and *Poictu*	03	00
On the Coaſt of *Portugal*	03	45
In *Plymouth*, and before *St. Paul's*	05	15
In the Haven at *St. Paul's*	06	00
Before *Podeſſemeck*	06	45
Thwart of *Plymouth*	07	30
At the Race of *Portland*	09	00
Q		
At *Queenborough*	12	00
R		
At *Rocheſter*	00	45
At *Ramkins*	01	30
At *Rotterdam*, in *Robin Hood's Bay*, and from the *Race* to the *Pole Head*	03	00
At *Rouen* and before *Rochel*	03	45
In *Ramſey*	05	15
S		
In the *Sleeve*, between *Uſhant* and *Scilly*, at the *Shoe*, at the *Spitts*, at *Southampton*, and along the *Swin*	12	00

Upon

	H	M
Upon the Coaſt of *Spain*, and in *Shetland*	03	00
At *Scilly*, in the *Sound*, *Scarborough*, and at *Staples*	03	45
At *Seven Iſles*, without the Haven in the *Broad Sound*	04	30
At the Mouth of *Severn*, between *Scilly* and the *Lizard*, at the *Spurn* and *Stockton*	05	15
Without *Scilly*, in the Channel, and at *Salcomb*	06	00
At *Sedmouth*, and at the *Start*	06	45
Off the *Start* in the Channel	07	30
Within the *Seyn*, and before *Shelburgh*	09	00
At *Shoreham*	09	45
At *Seyn-Head*	10	30

T

Within *Tervere*	00	45
Before *Tervere*, before the *Thames*, and at *Tinmouth*	01	30
Before the *Tees* and *Tinmouth* before the Bay of *Tinmouth*	03	00
At the Cliffs of the *Texel*	04	30
In *Torbay* and before the *Texel*	06	00
In the Road of the *Texel*	07	30
At *Torgen*	09	45

U

Before *Ureck*	12	00
At *Uſe*	03	00
Between *Uſhant* and the *Main*	03	45
In the *Vourd*, at the Bay within *Uſhant*	04	30
Without *Uſhant*	06	00
St. Vallery	10	30

W

At *Winchelſea*	00	45
At the *Weilings*, and from the Weſt End of the *Wight*	01	30
Before the *Weilings*	02	15
At *Whitby*	03	00
In the Sea of *Wales*, and *Severn*	04	30
In *Wales*	05	15
At *Wells*, at *Weymouth*, and at *Waterford*	06	00
At *Weymouth* Key	06	45
At the *Neſs*, by *Wieringhen*, at *Winterton*	07	30
Thwart of the Iſle of *Wight* in the Channel, all within the *Wight*, between the *Wight* and *Beachy* by the Shore	08	15
At the E. End of the *Wight*, and on *Wieringhen* Flats	09	00

Y

Before *Yarmouth*	01	30
At *Youghall*	04	30
At *Yarmouth*	08	15
In *Yarmouth* Roads and *Yarmouth* Haven	10	30

Z

On Coaſt of *Zealand*	01	30
In the *Zerick* Sea	03	00

The Uſe of the TIDE-TABLE, *in finding the Time of* High Water.

IN this Table the Names of the Places being ſet in alphabetical Order, they will always be found under the Letter they begin with, as for Example, *London* will be found under the Letter L, *Torbay* under T, *Scilly* under S, *&c.* and the Figures right againſt any Place ſhews the Time of High-Water at that Place on the Full and Change of the Moon.

Then if it be required to find the Time of High Water at any Place upon any given Day, Firſt, (by the Tables of Numbers and Times anſwering) find the Number and Time anſwering for that Day, (as before taught) and to that Time add the Hours and Minutes that ſtand in the Tide-Table againſt the Place you would know the Time of High-Water at, the Sum, if it doth not exceed 12 Hours, will be the Time of High Water required; but if it ſhould be more than 12 Hours, then ſubtract 12 from it, and the Remainder will be the Time of High-Water.

EXAMPLE I.

Suppoſe it was required to find the Time of High-Water at London, *on the 30th of* January, 1775.

By the Table of Numbers I find the Number for the 30th of *January* to be 38, with which Number entering the Table of Times, I find the Time anſwering to be 10 H. 24 M. then looking for *London* in the Tide-Table, I find againſt it 3 Hours, which added to the Time before found, gives 13 H. 24 M. from which ſubtract 12,00, and the Remainder 1 H. 24 M. the Time of High-Water at *London* on the 30th of *January*, 1775.

EXAMPLE II.

Suppoſe it was required to find the Time of High Water at St. Helen's, *on the 28th of* April, 1779.

Having found the Number (as before) to be 22, and the Time anſwering to be 9 H. 36 M. I look in the Tide-Table under the Letter H. for *St. Helen's*, againſt which I find 10 H. 30 M. which added to the Time (as before) 9.36 gives 20.06, from which ſubtract 12.00, and the Remainder 8 H. 06 M. is the Time of High-Water required.

A TABLE of the Sun's Declination for the Years 1773, 1777, 1781, and 1785.

M. Day	January	February	March	April	May	June	July	August	September	October	November	December
	South	South	South	North	North	North	North	North	North	South	South	South
1	23 58	16 56	07 22	04 45	15 14	22 08	23 07	17 56	08 08	03 23	14 37	21 55
2	22 53	16 39	06 59	05 08	15 32	22 16	23 02	17 41	07 46	03 46	14 56	22 04
3	22 47	16 21	06 36	05 31	15 49	22 23	22 57	17 25	07 24	04 09	15 15	22 13
4	22 41	16 03	06 13	05 54	16 07	22 30	22 52	17 09	07 02	04 33	15 34	22 21
5	22 34	15 45	05 50	06 16	16 24	22 37	22 47	16 53	06 59	04 56	15 52	22 28
6	22 26	15 26	05 27	06 39	16 41	22 43	22 41	16 37	06 17	05 19	16 10	22 35
7	22 19	15 07	05 03	07 02	16 57	22 49	22 34	16 20	05 55	05 42	16 28	22 42
8	22 11	14 48	04 40	07 24	17 14	22 54	22 27	16 03	05 32	06 05	16 45	22 48
9	22 02	14 29	04 17	07 46	17 30	22 59	22 20	15 45	05 07	06 28	17 02	22 54
10	21 53	14 10	03 53	08 08	17 45	23 04	22 13	15 28	04 46	06 51	17 19	23 00
11	21 43	13 50	03 30	08 30	18 01	23 08	22 05	15 10	04 28	07 13	17 36	23 04
12	21 34	13 30	03 06	08 52	18 16	23 12	21 56	14 52	04 01	07 36	17 52	23 09
13	21 23	13 10	02 42	09 14	18 31	23 15	21 48	14 34	03 38	07 58	18 08	23 13
14	21 13	12 50	02 19	09 36	18 45	23 18	21 39	14 15	03 14	08 21	18 24	23 16
15	21 02	12 29	01 55	09 57	18 59	23 21	21 29	13 56	02 51	08 43	18 39	23 19
16	20 50	12 08	01 31	10 18	19 13	23 23	21 19	13 37	02 28	09 05	18 54	23 22
17	20 38	11 47	01 08	10 39	19 27	23 25	21 09	13 18	02 05	09 27	19 09	23 24
18	20 26	11 26	00 44	11 00	19 46	23 26	20 59	12 59	01 42	09 49	19 23	23 26
19	20 13	11 04	00 26	11 21	19 53	23 27	20 48	12 39	01 18	10 11	19 37	23 27
20	20 00	10 43	No.03	11 42	20 05	23 28	20 37	12 19	00 55	10 32	19 51	23 28
21	19 47	10 21	00 27	12 02	20 17	23 28	20 25	11 59	00 31	10 54	20 04	23 28
22	19 33	09 59	00 51	12 22	20 29	23 28	20 13	11 39	00 08	11 15	20 17	23 28
23	19 19	09 37	01 14	12 42	20 41	23 27	20 01	11 19	Sou 15	11 36	20 29	23 27
24	19 04	09 15	01 38	13 02	20 52	23 26	19 48	10 58	00 39	11 57	20 41	23 26
25	18 49	08 53	02 02	13 21	21 03	23 24	19 36	10 38	01 02	12 18	20 53	23 24
26	18 34	08 30	02 25	13 41	21 13	23 22	19 22	10 17	01 26	12 39	21 03	23 22
27	18 19	08 08	02 49	14 00	21 23	23 20	19 09	09 56	01 49	12 59	21 16	23 20
28	18 03	07 55	03 12	14 19	21 33	23 17	18 55	09 34	02 11	13 19	21 26	23 16
29	17 47		03 35	14 37	21 42	23 14	18 41	09 13	02 36	13 39	21 36	23 13
30	17 30		03 59	14 56	21 31	23 10	18 26	08 51	02 59	13 59	21 46	23 09
31	17 13		04 22		22 00		18 11	08 30		14 18		23 05

A TABLE of the Sun's Declination for the Years 1774, 1778, 1782, and 1786.

M. Day.	January	February	March	April	Mny	June	July	August	September	October	November	December
	South	South	South	North	North	North	North	North	North	South	South	South
1	23 00	17 00	07 28	04 39	15 09	22 06	23 08	18 00	08 13	03 17	14 33	21 53
2	22 54	16 43	07 05	05 02	15 27	22 14	23 03	17 45	07 51	03 41	14 52	22 02
3	22 48	16 25	06 42	05 25	15 45	22 21	22 59	17 29	07 29	04 04	15 11	22 11
4	22 42	16 07	06 19	05 48	16 03	22 29	22 54	17 13	07 07	04 27	15 29	22 19
5	22 35	15 49	05 56	06 11	16 20	22 35	22 48	16 57	06 45	04 50	15 48	22 26
6	22 28	15 31	05 32	06 34	16 37	22 42	22 42	16 40	06 21	05 13	16 06	22 34
7	22 21	15 12	05 09	06 56	16 53	22 47	22 36	16 24	06 00	05 36	16 23	22 40
8	22 13	14 53	04 46	07 19	17 10	22 53	22 29	16 07	05 37	05 59	16 41	22 47
9	22 04	14 34	04 25	07 41	17 26	22 58	22 22	15 50	05 15	06 22	16 58	22 53
10	21 55	14 14	03 59	08 03	17 41	23 03	22 15	15 32	04 52	06 45	17 15	22 58
11	21 46	13 55	03 35	08 25	17 57	23 07	22 07	15 14	04 29	07 08	17 32	23 03
12	21 36	13 35	03 12	08 47	18 12	23 11	21 59	14 56	04 06	07 30	17 48	23 08
13	21 26	13 15	02 48	09 09	18 27	23 15	21 50	11 38	03 43	07 53	18 04	23 12
14	21 15	12 54	02 24	09 30	18 42	23 18	21 41	14 20	03 20	08 15	18 20	23 16
15	21 04	12 34	02 01	09 52	18 56	23 20	21 32	14 01	02 57	08 38	18 36	23 19
16	20 53	12 13	01 37	10 13	19 10	23 23	21 22	13 42	02 34	09 00	18 51	23 21
17	20 41	11 52	01 13	10 34	9 23	23 25	21 12	13 23	02 10	09 22	19 05	23 24
18	20 29	11 31	01 50	10 55	19 37	23 26	21 01	13 04	01 47	09 44	19 20	23 25
19	20 16	11 09	00 26	11 16	19 50	23 27	20 51	12 44	01 24	10 06	19 34	23 27
20	20 03	10 48	00 02	11 37	20 02	23 28	20 40	12 24	01 00	10 17	19 47	23 28
21	19 50	10 26	No. 21	11 57	20 15	23 28	20 08	12 04	00 37	10 49	20 01	23 28
22	19 36	10 04	00 45	12 17	20 26	23 28	20 16	11 44	00 14	11 10	20 14	23 28
23	19 22	09 42	01 09	12 37	20 38	23 27	20 04	11 24	Sou 10	11 01	20 26	23 27
24	19 08	09 20	01 32	12 27	20 49	23 26	19 52	11 03	00 33	11 53	20 39	23 29
25	18 53	08 58	01 56	13 17	21 00	23 25	19 39	10 43	00 37	12 13	20 50	23 25
26	18 38	08 36	02 19	13 36	21 11	23 23	19 26	10 22	01 20	12 34	21 02	20 23
27	18 22	08 13	02 43	13 55	21 21	23 21	19 12	10 01	01 44	12 54	21 13	23 20
28	18 07	07 50	03 06	14 14	21 31	23 18	18 58	09 40	02 07	13 14	21 24	23 17
29	17 50		03 30	14 33	21 40	23 15	18 44	09 18	02 30	13 34	21 34	23 14
30	17 34		03 53	14 51	21 49	23 11	18 30	08 57	02 54	13 54	21 44	23 11
31	17 07		04 16		21 58		18 15	08 35		14 14		23 07

A TABLE of the Sun's Declination for the Years 1775, 1779, 1783, and 1787.

M. Day.	January	February	March	April	May	June	July	August	September	October	November	December
	South	South	South	North	North	North	North	North	North	South	South	South
1	23 01	17 04	07 33	04 34	15 05	22 04	23 08	18 03	08 19	03 12	14 28	21 51
2	22 56	16 47	07 10	04 57	15 23	22 14	23 04	17 48	07 57	03 35	14 47	22 00
3	22 50	16 30	06 47	05 20	15 41	22 20	23 00	17 33	07 35	03 58	15 06	22 09
4	22 44	16 12	06 24	05 43	15 58	22 27	22 55	17 17	07 13	04 21	15 25	22 17
5	22 37	15 54	06 01	06 05	16 16	22 34	22 49	17 01	06 50	04 45	15 43	22 25
6	22 30	15 35	05 38	06 28	16 33	22 40	22 44	16 45	06 28	05 08	16 01	22 32
7	22 23	15 17	05 15	06 51	16 49	22 46	22 37	16 28	06 05	05 31	16 19	22 39
8	22 15	14 58	04 51	07 13	17 06	22 52	22 31	16 11	05 43	05 54	16 37	22 46
9	22 06	14 39	04 28	07 36	17 22	22 57	22 24	15 54	05 20	06 17	16 54	22 51
10	21 57	14 19	04 04	07 58	17 38	23 02	22 16	15 36	04 58	06 40	17 11	22 57
11	21 48	13 59	03 41	08 20	17 53	23 06	22 09	15 19	04 35	07 02	17 28	23 02
12	21 38	13 40	03 17	08 42	18 06	23 10	22 01	15 01	04 12	07 25	17 44	23 07
13	21 28	13 20	02 54	09 04	18 23	23 14	21 52	14 43	03 49	07 48	18 00	23 11
14	21 18	12 59	02 30	09 25	18 38	23 17	21 43	14 24	03 26	08 10	18 16	23 15
15	21 07	12 39	02 06	09 47	18 52	23 20	21 34	14 06	03 02	08 32	18 32	23 18
16	20 56	12 18	01 43	10 08	19 06	23 22	21 24	13 45	02 39	08 55	18 47	23 21
17	20 44	11 57	01 19	10 29	19 20	23 24	21 14	13 28	02 16	09 17	19 08	23 23
18	20 22	11 36	00 45	10 50	19 33	23 26	21 04	13 08	01 53	09 38	19 16	23 25
16	20 19	11 15	00 32	11 11	19 47	23 27	20 53	12 46	01 29	10 00	19 30	23 26
20	20 06	10 53	00 08	11 32	19 59	23 28	20 42	12 29	01 06	10 22	19 44	23 27
21	19 53	10 32	No. 16	11 52	20 12	23 28	20 31	12 09	00 43	10 44	19 58	23 28
22	19 40	10 10	00 39	12 12	20 24	23 28	20 19	11 49	00 19	11 05	20 11	23 28
23	19 26	09 48	01 03	12 32	20 35	23 27	20 07	11 29	Sou 04	11 26	20 23	23 27
24	19 11	09 26	01 27	12 52	20 47	23 26	19 55	11 08	00 28	11 47	20 36	23 26
25	18 57	09 03	01 50	13 12	20 58	23 25	19 42	10 48	00 51	12 08	20 48	23 25
26	18 42	08 41	02 14	13 31	21 08	23 23	19 29	10 27	01 14	12 29	20 59	23 23
27	18 26	08 19	02 37	13 51	21 18	23 20	19 15	10 06	01 38	12 49	21 10	23 21
28	18 10	07 56	03 01	14 10	21 28	23 19	19 02	09 43	02 01	13 09	21 21	23 18
29	17 54		03 24	14 28	21 38	23 16	18 48	09 25	02 25	13 29	21 31	23 15
30	17 38		03 47	14 47	21 47	23 12	18 33	09 02	02 48	13 49	21 41	23 11
31	17 21		04 10		21 56		18 19	08 40		14 09		23 07

39 - 12

A TABLE of the Sun's Declination for the Years 1776, 1780, 1784, and 1788.

M. Day.	January	February	March	April	May	June	July	August	September	October	November	December
	South	South	South	North	North	North	North	North	North	South	South	South
1	23 02	17 10	07 17	04 50	15 18	22 10	23 05	17 53	08 03	03 29	14 42	21 58
2	22 57	16 54	06 54	05 13	15 36	22 18	23 01	17 37	07 41	03 52	15 01	22 06
3	22 51	16 35	06 31	05 36	15 54	22 25	22 56	17 21	07 19	04 15	15 20	22 15
4	22 46	16 17	06 08	06 00	16 11	22 32	22 51	17 05	07 56	04 38	15 38	22 23
5	22 39	15 59	05 44	06 22	16 28	22 38	22 45	16 49	06 34	05 01	15 56	22 30
6	22 32	15 40	05 21	06 45	16 46	22 44	22 39	16 32	06 12	05 25	16 14	22 37
7	22 25	15 22	04 58	07 07	17 01	22 50	22 33	16 16	05 49	05 48	16 32	22 44
8	22 17	15 03	04 34	07 30	17 17	22 56	22 26	15 59	05 26	06 10	16 49	22 50
9	22 08	14 44	04 11	07 52	17 33	23 01	22 18	15 41	05 04	06 33	17 07	22 56
10	21 00	14 24	03 47	08 14	17 49	23 05	22 11	15 24	04 41	06 56	17 23	23 01
11	21 51	14 05	03 24	08 36	18 04	23 09	22 03	15 06	04 18	07 19	17 40	23 06
12	21 41	13 45	03 00	08 58	18 19	23 13	21 54	14 48	03 50	07 41	17 56	23 10
13	21 31	13 25	02 37	09 19	18 34	23 16	21 46	14 29	03 32	08 04	18 12	23 14
14	21 21	13 05	02 13	09 41	18 59	23 19	21 37	14 11	03 10	08 26	18 28	23 17
15	21 10	12 44	01 49	10 02	19 03	23 22	21 27	13 52	02 46	08 48	18 43	23 20
16	20 59	12 24	01 26	10 24	19 16	23 24	21 17	13 33	02 22	09 11	18 58	23 23
17	20 47	12 03	01 02	10 46	19 30	23 25	21 07	13 14	01 59	09 33	19 12	23 25
18	20 35	11 42	00 38	11 05	19 43	23 26	20 57	12 54	01 36	09 54	19 27	23 26
19	20 22	11 20	00 14	11 26	19 56	23 27	20 45	12 34	00 13	10 16	19 40	23 27
20	20 16	10 59	No. 09	11 47	20 08	23 28	20 34	12 15	00 49	10 38	19 54	23 28
21	19 57	10 37	00 33	12 07	20 20	23 28	20 22	11 54	00 26	10 59	20 07	23 28
22	19 43	10 16	00 56	12 27	20 32	23 27	20 10	11 34	00 02	11 20	20 20	23 28
23	19 29	09 54	01 20	12 47	20 43	23 26	19 58	11 14	Sou21	11 41	20 32	23 27
24	19 15	09 31	01 45	13 07	20 55	23 25	19 45	10 53	00 45	12 02	20 44	23 26
25	19 01	09 09	02 07	13 26	21 05	23 24	19 32	10 32	01 08	12 23	20 56	23 24
26	18 46	08 47	02 31	13 45	21 16	23 22	19 19	10 12	01 31	12 43	21 07	23 22
27	18 30	08 25	02 54	14 04	21 26	23 19	19 05	09 50	01 55	13 04	21 18	23 19
28	18 15	08 02	03 18	14 23	21 35	23 17	18 52	09 29	02 18	13 24	21 29	23 16
29	17 59	07 39	03 41	14 42	21 44	23 13	18 33	09 08	02 42	13 41	21 39	23 12
30	17 43		04 04	15 00	21 53	23 10	18 23	08 46	03 05	14 03	21 48	23 08
31	17 26		04 27		22 02		18 08	08 24		14 23		23 00

A TABLE of the Variation of the Sun's Declination to every 10 Degrees of Longitude.

Degrees of Longitude from the Meridian of LONDON.

Daily Vari.	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
Min.	min	min	min	min	min	min	min	min	min	min	min	min	min	min	min	min	min	min
2	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
3	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
4	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2
5	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2
6	0	0	0	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3
7	0	0	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3
8	0	0	1	1	1	1	1	2	2	2	2	3	3	3	3	3	4	4
9	0	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4
10	0	1	1	1	1	2	2	2	3	3	3	3	4	4	4	5	5	5
11	0	1	1	1	2	2	2	3	3	3	3	4	4	4	5	5	5	5
12	0	1	1	1	2	2	2	3	3	3	4	4	4	5	5	5	6	6
13	0	1	1	1	2	2	2	3	3	4	4	4	5	5	5	6	6	6
14	0	1	1	2	2	2	3	3	3	4	4	5	5	5	6	6	7	7
15	0	1	1	2	2	3	3	3	4	4	5	5	5	6	6	7	7	7
16	0	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8
17	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	7	8	8
18	1	1	2	2	3	3	4	4	5	5	6	6	7	7	7	8	9	9
19	1	1	2	2	3	3	4	4	5	5	6	6	7	7	7	8	9	9
20	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10
21	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	10
22	1	1	2	2	3	4	4	5	6	6	7	7	8	9	9	10	10	11
23	1	1	2	3	3	4	4	5	6	6	7	8	8	9	10	10	11	11
24	1	1	2	3	3	4	5	5	6	7	7	8	9	9	10	11	11	12

To find the Sun's Declination by the foregoing TABLES.

EACH Page of the foregoing Tables contains the Sun's Declination for the four Years that it is marked with at the Top, and is divided into thirteen Columns; the firſt of which to the Left-Hand, ſhews the Day of the Month, and the other Twelve the Months of the Year, ſo that if it be required to find the Sun's Declination for any Day, as ſuppoſe for Example, on the 21ſt of *Auguſt*, 1779: Firſt I look for that Table that has 1779, at the Top of it, and then right againſt the 21ſt Day of the Month, and under *Auguſt*, I find 12 09, which ſhews the Sun's Declination to be 12 Degrees 09 Minutes North; according to the Title at the Top of the Column.

The Sun's Declination in theſe Tables being calculated for the Meridian of *London*, if you ſhould be conſiderably to the Eaſtward, or to the Weſtward of *London*, it will cauſe ſome Alteration in it; to correct which, the

Table of Variation of the Sun's Declination is to be uſed as follows.

Firſt, Look out the Declination for the given Day of the Month, and for the Day following it, and ſubtract the leſs from the greater, the Remainder is the daily Variation.

Second, Obſerve whether the Declination be increaſing or decreaſing, which you may know thus; if the Declination for the Day following the given Day be biggeſt, then it is increaſing; but if it be leaſt, it is decreaſing.

Third, Look for the Daily Variation in the firſt Column of the Table, and ſee what Number ſtands right againſt it, and under the given Degrees of Longitude, which Number is to be uſed as follows.

If the Difference of Longitude be Eaſterly, and the Declination increaſing, it muſt be ſubtracted from the Declination found in the Tables for the given Day; but if the Declination be decreaſing, it muſt be added.

If the Difference of Longitude be Weſterly, and the Declination increaſing, it muſt be added; but if the Declination be decreaſing, it muſt be ſubtracted; the Sum in one Caſe, and the Remainder in the other will be the Sun's Declination at Noon in the Longitude required.

A TABLE of the Sun's Right Ascension.

M. Day.	January		February		March		April		May		June		July		August		September		October		November		December	
	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M
1	18	50	21	02	22	51	00	44	02	35	04	38	06	42	08	47	10	43	12	31	14	28	16	32
2	18	54	21	06	22	54	00	48	02	39	04	42	06	46	08	51	10	47	12	35	14	31	16	36
3	18	58	21	10	22	58	00	51	02	43	04	46	06	50	08	55	10	50	12	38	14	35	16	40
4	19	03	21	14	23	02	00	55	02	47	04	50	06	55	08	59	10	54	12	42	14	39	16	45
5	19	07	21	18	23	05	00	59	02	51	04	54	06	59	09	02	10	57	12	46	14	43	16	49
9	19	12	21	22	23	09	01	02	02	54	04	59	07	03	09	06	11	01	12	49	14	47	16	53
7	19	16	21	26	23	13	01	06	02	58	05	03	07	07	09	10	11	05	12	53	14	51	16	58
8	19	20	21	30	23	17	01	10	03	02	05	07	07	11	09	14	11	08	12	57	14	55	17	02
9	19	25	21	34	23	20	01	13	03	06	05	11	07	15	09	18	11	12	13	00	14	59	17	07
10	19	29	21	38	23	24	01	17	03	10	05	15	07	19	09	21	11	16	13	04	15	03	17	11
11	19	33	21	42	23	28	01	21	03	14	05	19	07	23	09	25	11	19	13	08	15	07	17	15
12	19	38	21	46	23	31	01	24	03	18	05	23	07	27	09	29	11	23	13	11	15	12	17	20
13	19	42	21	50	23	35	01	28	03	22	05	27	07	31	09	33	11	26	13	15	15	16	17	24
14	19	46	21	53	23	39	01	32	03	26	05	32	07	36	09	37	11	30	13	19	15	20	17	29
15	19	51	21	57	23	42	01	35	03	30	05	36	07	40	09	40	11	33	13	23	15	24	17	33
16	19	55	22	01	23	46	01	39	03	34	05	40	07	44	09	44	11	37	13	26	15	28	17	38
17	19	59	22	05	23	50	01	43	03	38	05	44	07	48	09	48	11	41	13	30	15	32	17	42
18	20	04	22	09	23	53	01	46	03	41	05	48	07	52	09	52	11	44	13	34	15	36	17	46
19	20	08	22	13	23	57	01	50	03	45	05	52	07	56	09	55	11	48	13	38	15	40	17	51
20	20	12	22	17	00	00	01	54	03	49	05	57	08	00	09	59	11	51	13	41	15	45	17	55
21	20	16	22	20	00	04	01	58	03	53	06	01	08	04	10	03	11	55	13	45	15	49	18	00
22	20	20	22	24	00	07	02	01	03	57	06	05	08	08	10	06	11	59	13	49	15	53	18	04
23	20	25	22	28	00	11	02	05	04	01	06	09	08	12	10	10	12	02	13	53	15	57	18	09
24	20	29	22	32	00	15	02	09	04	06	06	13	08	16	10	14	12	06	13	57	16	02	18	13
25	20	33	22	36	00	19	02	13	04	10	06	17	08	20	10	17	12	09	14	00	16	06	18	18
26	20	37	22	39	00	22	02	16	04	14	06	22	08	23	10	21	12	13	14	04	16	10	18	22
27	20	41	22	43	00	26	02	20	04	18	06	26	08	27	10	25	12	17	14	08	16	14	18	26
28	20	45	22	47	00	30	02	24	04	22	06	30	08	31	10	28	12	20	14	12	16	19	18	31
29	20	49			00	33	02	28	04	26	06	34	08	35	10	32	12	24	14	16	16	23	18	35
30	20	54			00	37	02	31	04	30	06	38	08	39	10	36	12	27	14	20	16	27	18	40
31	20	58			00	40			04	34			08	43	10	39			14	24			18	44

A TABLE of the Right Aſcenſion in Time, and Declination of ſome of the moſt noted fixed Stars.

The Names of the Stars.	Right-Aſcen. H.	M.	Declination. D.	M.	
The Bright Star of Aries	01	54	22	22	N
Meduſa's Head, Algol	02	52	39	59	N
The Bright Side of Perſeus	03	07	48	58	N
The Bull's Eye, Aldebaran	04	22	16	09	N
The Goat Star, Capella	04	59	45	44	N
The Bright Foot of Orion, Regel	05	01	08	28	S
The Northern Horn of the Bull	05	09	28	21	N
Orion's Left Shoulder	05	10	06	04	N
The Southern Horn of the Bull	05	21	20	56	N
Middle Star in Orion's Belt	05	22	01	25	S
Orion's Right Shoulder	05	52	07	20	N
Auriga's Right Shoulder	05	44	44	54	N
Bright Foot of Gemini	06	20	16	38	N
The Dog Star, Syrius	06	34	16	23	S
Caſtor, or the Head of the Northermoſt Twin	07	20	32	24	N
The little Dog Star, Procyon	07	26	05	49	N
Pollux, or the Head of the Southermoſt Twin	07	28	28	34	N
Hydra's Heart	09	16	07	37	S
The Lyon's Heart, Regulus	09	53	12	56	N
The Lower of the Pointers	10	45	57	41	N
The Upper of the Pointers	10	46	63	03	N
The Lyon's Tail, Deneb	11	35	15	55	N
Upper of the two laſt in the ſquare of Great Bear	12	04	58	35	N
The firſt in the Great Bear's Tail	12	41	57	18	N
The Virgin's Spike	13	12	09	52	S
The middle of the three in the Great Bear's Tail	13	11	56	22	N
Laſt but one in the Tail of Hydra	13	50	21	43	S
Laſt in the Great Bear's Tail	13	36	50	31	N
Arcturus	14	03	20	26	N
Bright Star in the Southern Balance	14	35	14	53	S
Foremoſt Guard	15	51	75	15	N

Bright

A TABLE of the Fixed Stars.

The Names of the Stars.	Right Aſcen. H.	M.	Declination. D.	M.	
Bright Star of the Crown	15	22	27	33	N
Bright Star in the Serpent's Neck	15	31	07	18	N
The Scorpion's Heart, Antares	16	41	25	51	S
The Head of Hercules	17	03	14	40	N
In the Head of Serpentarius	17	22	12	47	N
Bright Star in the Dragon's Head	17	50	51	32	N
Lyræ, or the Harp	18	27	38	33	N
Swan's Beak	19	17	27	29	N
Bright Star in the Eagle	19	39	08	14	N
The Swan's Tail	20	33	44	19	N
Pegaſus's Mouth	21	27	03	39	N
Fomelhaut	22	42	30	55	S
Pegaſus's Wing, Marchab	22	53	13	53	N
Pegaſus's Leg, Scheat	22	52	26	43	N
Caphus's Knee	23	20	76	07	N
The Head of Andromeda	23	54	27	34	N
End of Pegaſus's Wing, Algenib	23	58	13	39	N
Pole Star	00	42	88	00	N
Girdle of Andromeda	00	53	34	05	N

A TABLE of the Right Aſcenſion and Declination of the *Croſiers.*

	Right Aſcen. H.	M.	Declination D.	M.	
The Weſtermoſt of the two middle Stars	12	03	57	28	S
The Eaſtermoſt	12	33	58	26	S
The Northermoſt or higheſt Star	12	18	55	30	S
The Southermoſt or loweſt	12	12	61	48	S

To

To work an Obſervation, or to find the Latitude of the Place by the Tables of the Sun or Stars Declination, and their Zenith Diſtance, &c.

Note, WHEN you take an Obſervation of the Sun, by the common Sea Quadrant, the Degrees and Minutes that your Sight Vane ſtands at, being added to the Degrees that your Shade or Glaſs Vane ſtands at, will give the Zenith Diſtance (or Complement of the Meridian Altitude) with which, and the Declination found in the Tables, you may find the Latitude as follows.

Firſt, Take Notice whether the Sun or Star be to the Northward or to the Southward of you at the Time of Obſervation; if they are to the Northward, call your Zenith Diſtance North; or if they are to the Southward, call it South. Then,

Second, If the Zenith Diſtance and Declination are both North, or both South, ſubtract the leſs from the greater, the Remainder will be the Latitude you are in, of the ſame Name with the Declination, if that be greater than the Zenith Diſtance, otherwiſe of a contrary Name.

Example 1ſt. Being at Sea on the 23d of *Auguſt*, 1775, I obſerved at Noon, and had on my Quadrant 8. 34. (and the Sun to the Northward of me) what Latitude am I in?

Zenith Diſtance	8. 34	North
Declination	11. 29	North
Latitude by Obſervation	2. 55	North

Example 2d. Being at Sea on the 23d of *December*, I took the Altitude of the Dog Star *Syrius*, (on the Meridian to the Southward of me) 60. 00, I would know the Latitude?

Note, In all Caſes (except where the Object is obſerved on the Meridian below the Pole) if the Meridian Altitude be given inſtead of the Zenith Diſtance, (as it is in this Example) then ſubtract it from 90. 00, and the Remainder will be the Zenith Diſtance.

Meridian Altitude from 90. 00, leaves the Zen. Diſt.	30. 00	South
Star's Declination (by the Table)	16. 23	South
Latitude by Obſervation	13. 37	North

To

To work an Obſervation.

Caſe the 2d, If the Zenith Diſtance and Declination be one North and the other South, add them together, and their Sum will be the Latitude in, of the ſame Name with the Declination.

Example 1ſt, Being at Sea on the 3d of *November*, 1775, I obſerved at Noon, and had on my Quadrant 8 17, (and the Sun to the Northward of me) I demand the Latitude?

Zenith Diſtance	08. 17	North
Declination	15. 06	South
Latitude by Obſervation	23. 23	South

Example 2d, Being at Sea on the 21ſt of *June*, 1777, I took the Altitude of the Bright Star in the *Harp Lyræ*, (on the Meridian to the Southward of me) 51. 00, I demand the Latitude?

Complement Altitude, or Zenith Diſtance	39. 00	South
Star's Declination	38. 33	North
Latitude by Obſervation	77. 33	North

The foregoing Rules are for obſerving by the Sun or Stars, when they are at their greateſt Altitude, or upon the Meridian above the Pole; but as in ſome Parts of the Earth the Sun does not ſet for ſeveral Days, and ſome Stars never ſet; in that Caſe they may be obſerved upon the Meridian, twice in the 24 Hours, that is, once at their greateſt Height (as before) and again, when they are at the loweſt, or upon the Meridian below the Pole; to work which Obſervation, take the following Rule.

Add the Complement of the Declination to the Meridian Altitude, the Sum is the Latitude of the ſame Name with the Declination.

Example, Being at Sea, I took the Altitude of the Pole Star on the Meridian below the Pole, 46. 21. I demand the Latitude?

Meridian Altitude	46. 21	
Complement Declination	01. 56	North
Latitude by Obſervation	48. 17	North

The

REMARKS by the Reviſor.] The Author in the above Rules and Examples, takes the Sum of the Numbers found on his Quadrant, and works with it, as if true, to find the Latitude; But the Latitude ſo obtained will be ſeveral Minutes from the true Latitude. For obtaining which, the Zenith Diſtance, as found by the Quadrant, muſt be corrected, as ſhewn in the MARINERS COMPASS RECTIFIED.

The Uſe of the TABLES of the Sun's and Stars Right Aſcenſion, in finding what Time any known Star will be upon the Meridian, on any given Day.

Rule, Look for the Right Aſcenſion of the Sun and Star in the foregoing Tables, and ſubtract the Sun's Right Aſcenſion from the Star's; but if the Sun's Right Aſcenſion be biggeſt, add 24 Hours to the Star's Right Aſcenſion, and then ſubtract the Sun's from it, the Remainder will be the Time of the Star's coming to the Meridian after Noon.

Example 1ſt. What Time will the *Lyon's Tail Deneb* be upon the Meridian, on the 14th of *April?*

	h.	m.
Star's Right Aſcenſion	11.	35
Sun's Right Aſcenſion	01.	32
Time the Star will be on the Meridian	10.	03 at Night

Example 2d, What Time will the *Bull's Eye* be on the Meridian on the 26th of *October?*

Star's Right Aſcenſion 4h. 22m. add 24, makes	28.	22
Sun's Right Aſcenſion	14.	04
Time the Star will be on the Meridian	14.	18

That is, *October* 26th, at 14h. 18m. from Noon, or at 18m. paſt two in the Morning of the 27th.

To find what Star will come upon the Meridian, at any given Time. *Rule*, Add the Time from Noon, to the Right Aſcenſion of the Sun, the Sum will be the Right Aſcenſion of the Star required to be known, with which enter the Table of the Star's Right Aſcenſion, and find what Star's Right Aſcenſion agrees with, or comes the neareſt to it, and this is the Star required

Example 1ſt, I would know what Star would be on the Meridian, about Eight at Night, on the 7th of *April?*

	h.	m.
Sun's Right Aſcenſion	01.	06
Time from Noon	08.	00
Right Aſc. of the req. Star, the neareſt to which	09.	06 is *Hydra's Heart*

Example 2d, I would know what Star would be on the Meridian, at ¼ paſt 2 in the Morning, on the 26th of *June.*

	h.	m.
Sun's Right Aſcenſion	06.	22
Time from Noon	14.	15
Rt. Aſc. of req. Star. neareſt to which in the Tables	20.	37 is *Swan's Tail.*

A TABLE of the Latitudes and Longitudes of Places, accounting the Longitudes from the Meridian of LONDON.

Places Names.	Latitude		Longit.		
The Coaſt of England.	D.	M	D.	M.	
Berwick	55	48	01	45	W
Newcaſtle	55	12	01	30	W
Stockton	54	33	01	25	W
Spurn	53	45	00	13	E
Yarmouth	52	40	01	40	E
London	51	32	00	00	
North Foreland	51	25	01	24	E
Beachy Head	50	46	00	25	E
Dunnoſe	50	38	01	23	
Portland	50	30	02	44	
Start	50	07	03	47	
Lizard	49	57	05	14	
Land's End	50	06	06	00	
St. Mary Scilly	49	57	06	10	
Hartland Point	51	06	04	35	
Lundy Iſle	51	20	04	40	
Briſtol	51	33	04	35	
St. David's Head	51	00	04	22	
Barſey Iſle	52	44	05	00	
Holyhead	53	23	04	50	
Liverpool	53	20	03	00	
Whitehaven	54	25	03	30	
Carliſle	54	47	03	05	

North Latitude — Weſt Longitude

The Coaſt of Scotland.

Glaſgow	55	52	04	05	
N. Part of Sky Iſle	57	45	05	45	
N. Part Lewis Iſle	58	20	07	20	
St. Kilday	57	52	09	45	
Farra Head	58	34	05	10	
Iſles of Orkney	59	10	03	22	
Shetland S. Point	60	04	02	00	
Buchanneſs	57	45	01	18	

North Latitude — Weſt Longitude

Places Names.	Latitude		Longit.	
	D.	M.	D.	M.
Aberdeen	57	24 N	01	40W
Duobee	56	28 N	02	40W
Edinburgh	55	58 N	02	59W

The Coaſt of Ireland.

Dublin	53	12	06	56
Wexford	52	13	07	27
Waterford	52	09	08	40
Cork	51	49	09	30
Cape Clear	51	17	11	10
Limeric	52	23	09	35
Galway	53	07	09	40
Slime Head	53	20	11	15
Londonderry	55	00	07	50
Bellfaſt	54	39	06	30

North Latitude — Weſt Longitude

The Coaſt of Holland and Flanders.

Scaw	57	30	10	20
Helighland	54	24	08	35
Hambrough	53	41	10	35
Embden	53	05	07	35
The Fly	53	15	05	30
The Texel	53	15	05	10
Amſterdam	52	23	05	04
Rotterdam	51	55	04	30
The Brill	52	00	04	00
Sluice	51	14	03	43
Calais	50	58	01	54

North Latitude — Eaſt Longitude

The Coaſt of France and Portugal.

Diep	49	56 N	01	09 E
Cape de Hague	49	47 N	02	00W
Gaſkets	49	50 N	02	20W
Guernſey	49	33 N	02	20W

A TABLE of Latitudes and Longitudes.

Places Names.	Latitude		Longit.	
The Coaſt of France and Portugal.	D.	M.	D.	M.
Morlaix	48	33	03	49
Uſhant	48	30	05	02
Breſt	48	23	04	25
Penmark	47	48	04	24
Belliſle	47	20	03	16
Nantz	47	14	01	39
Iſland Dieu	46	34	02	13
Iſle of Ree	46	10	01	30
Rochel	46	10	01	11
Bourdeaux	44	50	00	38
Bilboa	43	29	02	58
Cape Ortegal	44	04	07	48
Cape Finiſter	43	12	09	40
Oporto	41	10	09	25
Burlings	39	35	09	24
Rock of Liſbon	38	54	09	50
Cape St. Vincent	36	53	09	06
Cadiz	36	33	06	01
Cape Trefalgar	36	10	06	01

North Latitude. Weſt Longitude.

On the Main Continent within the Straits.

Gibraltar	36	12	04	53 W
Cape de Gat	36	40	01	40 W
Cape Paul	38	15	00	05
Cape Martin	38	46	00	40
Barcelona	41	26	02	18
Marſeilles	43	18	05	27
Toulon	43	07	06	02
Genoa	44	25	08	43
Leghorn	43	28	10	35
Rome	41	54	12	45
Naples	40	51	14	46
Cape Sparteventuro	37	55	16	55
Cape Collone	38	56	18	05
Gallipoli	39	56	18	43
Cape St. Mary	39	45	19	00

North Latitude. Eaſt Longitude.

Places Names.	Latitude		Longit.	
	D.	M.	D.	M.
Ancona	43	40	14	26
Venice	45	25	12	10
Lepanto	38	10	22	52
Cape Matapan	36	33	22	41
Cape St. Angelo	36	32	23	56
Athens	37	58	24	05
Cape Martelo South Part of Negropont	38	07	25	03
Cape Monte Sancto	40	26	25	02
Gallipoly	40	33	27	20
Conſtantinople	40	59	28	56
Smyrna	38	28	27	25
Epheſus	38	01	27	53
Antiocheta	36	30	32	46
Scanderoon	36	34	36	30
Tripoli	34	38	36	15
Alexandria	31	10	30	19
Cape Ruſato	32	48	21	25
Cape Miſerato	32	21	16	17
Tripoly	32	54	13	10
Cape Bona	37	03	11	04
Bona	37	02	08	19
Algier	37	05	03	16
Cape de Tres Forcas	35	30	02	04 W
Tetuan	35	27	05	06 W
Ceuta	35	54	04	45 W
Tangier	35	42	05	22 W

North Latitude. Eaſt Longitude.

Iſlands within the Straits.

Alboran	35	54	02	29 W
Formentaria	38	33	01	55
Yvica	38	50	01	40
Majorca City	39	30	03	03
Port Mahon	39	42	04	12
Gallita	37	41	08	44
S. end of Sardinia	38	46	09	12
N. end of Corſica	42	56	09	50

North Latitude. Eaſt Longitude

A TABLE of Latitudes and Longitudes.

Places Names.	Latitude		Longit.	
Iſlands within the Straits.	D.	M.	D.	M.
Gorgona	43	34	09	38
Captia	43	03	14	54
Lilboa	42	45	11	00
Meſſina	38	07	16	20
Maritimo	38	12	17	09
Cape Paſſaro	36	38	15	40
Malta	35	53	14	32
Corfu	39	42	20	06
Zephalonia	38	15	21	00
Zant	37	46	21	14
Morea	36	52	21	32
Lemnos	39	59	25	37
Scio	38	22	26	12
C. St. John Weſt-end of Candia	35	15	24	00
Cape Solomon Eaſt-end of Candia	35	00	27	08
City of Rhodes	36	42	28	05
Weſt-end of Cyprus	34	57	32	23
Eaſt-end of Cyprus	35	31	35	00

North Latitude. East Longitude.

The Coaſt of Barbary and Guiney.

Cape Spartel	35	50	05	49
Sallee	33	51	06	25
Cape Cantin	32	36	09	10
Cape de Geer	30	27	10	06
Cape Bajadore	26	04	15	35
Cape Olerado	23	41	15	50
Cape Blanco	20	32	17	35
Senegal	15	28	16	25
Cape de Verde	14	43	17	20
River Gambia	13	08	15	31
Sierralion	08	36	12	57
Cape Monſerado	06	05	10	02
Cape Palmas	04	13	06	45
Jaque Jaque	04	16	02	47

North Latitude. Weſt Longitude.

Places Names.	Latitude		Longit.	
	D.	M.	D.	M.
Aſſinee	04	15	02	17 W
Cape 3 Points	04	28	01	50 W
River Volta	05	55	03	25
River Formoſa	07	00	07	20
Cape Formoſa	04	15	06	40
New Callabar	04	42	08	33
Old Callabar	04	10	09	45
River Camaroons	03	25	10	10
River Angra	00	50	10	01
Cape Lopez	00	55	09	55
River Congo	05	40	15	25
Angola	08	57	15	56
Cape Negro	16	08	12	31
Cape St. Thomas	24	10	14	43
Cape Bona Eſperance	34	07	19	35

North Latitude. South Latitude. East Longitude.

Weſtern Iſlands.

Corvo	39	54	30	55
Flores	39	32	30	54
Fial	38	53	28	15
Pico	38	40	27	20
St. George	38	52	26	03
Tercera	38	57	25	34
St. Michael	38	06	23	36
St. Maries	36	59	23	38

North Latitude. Weſt Longitude.

The Canary Iſlands.

Ferro	27	54	17	45
Palma	28	40	17	36
Gomera	28	06	17	05
Tenariff	28	23	16	28
Madeira Weſt-end	32	44	17	26
Porto Sancto	33	12	15	54
Canaria	27	52	15	10
Forteventura	28	05	13	36
Lancerota	29	02	12	45

North Latitude. Weſt Longitude.

A TABLE of Latitudes and Longitudes.

Places Names.	Latitude			Longit.		
Cape de Verde Islands.	D.	M.		D.	M.	
St. Vincent	17	04	North Latitude.	24	39	West Longitude.
St. Lucia	17	00		24	30	
St. Nicholas	16	50		23	48	
Brava	14	28		24	02	
Fuego	14	50		23	41	
St. Jago	15	08		22	56	
Isle of May	15	14		22	02	
Isle Sal	16	50		22	08	
Bonavista	16	05		22	07	
The Southern Islands.						
St. Matthews	01	30	S	06	01	W
Ascension	07	40	S	14	25	W
St. Hellena	16	00	S	06	14	W
Fernandepo	02	40	N	10	30	E
Princes	01	40	N	09	15	E
St. Thomas	00	00		08	20	E
Annabona	02	10	S	07	27	E
The Coast on the Main Continent in the East-Indies.						
Cape Lagulias	34	54	S	21	20	
Cape Corientes	23	40	S	36	17	
Mosambique	15	04	S	41	10	
River de Fugos	00	14	S	41	15	
Cape Bassos	04	06	North Latitude.	47	38	East Longitude.
Cape Guardasoy	11	44		51	20	
Cape Rosulgat	22	41		59	45	
Cape Muca	23	32		59	45	
Bussera	29	45		49	20	
Surrat	21	10		72	25	
Goa	15	31		73	50	
Callicot	11	16		75	30	
Cochin	09	54		75	55	
Cape Camarine	07	50		77	25	
Fort St. George	13	11		80	32	
Dew Point	16	08		81	32	

Places Names.	Latitude			Longit.		
	D.	M.		D.	M.	
Visegapatam	17	43	North Latitude.	83	57	East Longitude.
Cape Palmiras	20	42		87	52	
Bengal	22	17		92	21	
Cape Negrais	16	23		93	00	
Malacca	02	12		102	10	
Siam Entrance	14	18		100	55	
Cambodia Entrance	10	28		105	00	
Cochin	14	05		107	56	
Canton	23	14		113	06	
Amoy or Quemoy	24	35		116	50	
Lampo	29	59		120	35	
Nanquin	32	55		120	01	
Islands in the East-Indies.						
Madagascar or St. Laurence — S. end	25	47	South Latitude.	46	10	East Longitude.
Madagascar or St. Laurence — N. end	12	10		51	05	
Mayetta	13	10		45	38	
Mohilla	12	05		44	23	
Comero	11	40		43	50	
St. Juan de Nova	16	30		42	40	
Mauritius	20	10		52	55	
Diego Roys	19	50		61	30	
Romiras de Castelmas	28	45		67	17	
Amsterdam	38	40		72	45	
St. Brandon	16	38		64	30	
Diego Gratiosa	08	40		68	25	
Quebella	03	53		52	36	
Bassos de Chagos	06	55		68	45	
Yas de Diego Rays	00	20	North Latitude.	72	00	
Maldivia — N. end	07	14		73	04	
Maldivia — S. end	00	25		76	22	
Malique	09	00		72	58	
Sacatra	12	21		54	05	
Abdeleur	12	04		53	04	

A TABLE of Latitudes and Longitudes.

Places Names.	Latitude			Longit.		
Islands in the East-Indies.	D.	M.		D.	M.	
C. Gallo, in Zeloan	06	07	North Latitude	81	15	East Longitude.
Yas de Amber	00	00		52	30	
Andaman	12	10		93	32	
Nichobar	07	11		93	40	
Sumatra N.W. end	05	22		94	50	
Verkins Island	02	22		94	07	
Nassau Island	02	54	South Latitude	99	32	
Bencola	03	55		104	08	
Sumatra SE. end	05	22		105	10	
Engano	05	50		101	43	
Selam	08	20		102	13	
Princes Island	06	30		104	02	
Bantam in Java	06	11		105	55	
Batavia	06	16		106	46	
Java E. end	08	32		113	30	
Straits of Sundy	06	02		105	46	
Banca S. end	03	20		106	45	
Borneo S. point	03	54		113	37	
Bandy Isles	04	55		127	17	
Celebes S. end	05	10		119	07	
Celebes N. end	01	40		121	20	
Mindano West Point	06	40	North Latitude	119	15	
Borneo North Point	07	10		113	05	
Luconia SW. point	12	30		120	10	
Luconia NE. point	18	35		120	05	
Anian W. point	19	30		107	00	
Anian E. point	19	55		109	55	
Formosa S. point	22	00		119	56	
Formosa N. point	25	30		120	45	
Piscadore Isles	23	30		118	35	
Island Chusan	30	38		120	35	
Japan SE. point	35	30		140	30	
Japan SW. point	35	00		128	30	

Places Names.	Latitude			Longit.		
The Coast of America, in the South-Sea.	D.	M.		D.	M.	
Cape St. Sebastians	42	45	North Latitude	127	55	West Longitude.
Cape St. Lucia	23	20		111	46	
Cape Corientes	19	40		109	30	
Aquapulco	17	05		104	18	
Aquatulco	15	27		102	03	
Guatimala	14	25		101	00	
Panama	08	50		81	52	
Bay Bonaventura	03	24		78	06	
Isle Gallopega	00	00		90	10	
Cape del Ajugo	06	30	South Latitude	84	50	
Lima	12	15		77	30	
Arica	18	29		73	10	
La Serena	29	00		76	22	
I. Juan Fernando	33	15		83	18	
Baldivia	39	35		81	10	
Port Steven	46	50		82	36	
Cape Victory	52	00		83	10	
Cape Horn	57	58		79	55	

The Coast of Brazil from Cape Horn to Cape Roque.

Magellan East Entrance	52	00	South Latitude	75	05
River Julian	48	40		74	34
Cape Blanco near River Camaroons	46	50		72	07
Buenos Ayres or River Plate	36	10		57	54
River Grand	31	55		52	00
St. Katharine's	27	50		49	00
Cape Frio	23	00		42	20
Spirito Sancto	19	59		42	10
P. Segura	16	31		40	35
Bay Todos Sanctos	12	46		41	00
River St. Francisco	10	50		37	50

West Longitude.

A TABLE of Latitudes and Longitudes.

Places Names.	Latitude		Longit.	
The Coaſt of Brazil, &c.	D.	M	D.	M.
Cape St. Auguſtine	08	35 S	35	20 W
Cape Roque	05	00 S	35	47 W
Triſtian de Cunha	37	05 S	13	24 W
Trinidada	20	30 S	30	00 W

Main Continent in the Weſt-Indies.

	North Latitude		Weſt Longitude	
R. Amazons Entrance	00	00	49	56
North Cape	02	05	49	56
Surinam	06	25	56	50
Oronoque	08	15	59	25
Cape Conquibaca	12	40	70	42
Carthagena	10	28	75	21
Scots Settlement	08	30	78	45
Nicaragua Entrance	11	25	84	15
Cape Catoche	21	10	86	10
Campechy	19	30	92	10
Le Vera Cruz	19	12	97	48
Eſcondido	30	20	89	30
Cape Florida	24	57	80	30

The Caribbee Iſlands.

	North Latitude		Weſt Longitude	
Trinidado	10	15	60	17
Tabago Weſt-end	11	10	59	10
Granado	11	57	60	20
Barbadoes	12	58	58	50
St. Vincent	13	12	60	12
St. Lucia	13	55	60	04
Martinico	14	43	60	54
Dominico	15	23	60	30
Marigallante	15	58	60	20
Guardalupe	16	10	61	15
Monſerat	16	45	62	15
Antigua	17	05	61	45
Nevis	17	05	62	32
St. Chriſtophers	17	17	62	40
Barbuda	17	56	60	40

Places Names.	Latitude		Longit.	
	D.	M.	D.	M.
St. Bartholomew	17	52	62	06
St. Martins	18	06	62	10
Anguilla	18	17	62	13
Virgins	18	30	63	25
St. Cruz	17	52	63	30
Bieque	18	00	63	15
Porto Rico St. Johns	18	30	65	37
St. Domingo Hiſp.	18	25	69	30
Port Royal Jamaica	17	40	76	32
Eaſt-end of Cuba	20	15	73	55
Havanna	22	40	82	55
Bay of Hondy	22	45	83	40
Cape St. Antony	21	45	85	32

(North Latitude. / Weſt Longitude.)

Bahama Iſlands.

	North Latitude		Weſt Longitude	
Bermudas	32	25	63	40
N. Point of Bahama Bank	28	00	78	35
Bahama Iſland	26	50	79	36
Abacco S. Point	26	00	73	46
Harbour Iſland	25	37	76	47
Andros N. Point	25	10	78	50
Providence	25	00	77	20
Illathera S. Point	24	40	75	56
Cat Iſland	24	25	75	09
Watling Iſland	24	03	74	35
Rum Key	23	45	74	50
Exuma	23	22	75	55
Crooked Iſland N. Point	22	56	74	12
Atkins Key	22	17	74	05
Meraparvouz	21	58	74	45
Atwoods Key	23	10	73	35
French Keys	22	40	73	40
Mayaguana	22	35	72	46
Hogſties	21	17	73	55

(North Latitude. / Weſt Longitude.)

A TABLE of Latitudes and Longitudes.

Places Names.	Latitude		Longit.	
Bahama Iſlands.	D.	M.	D.	M.
Heneago	20	52 N	73	46W
Caicos Bank North Point	21	50 N	71	15W
Turks Iſland	21	35 N	70	08W
Abrolho N. Point	21	35 N	69	06W
Plate Wreck	20	10 N	68	15W
The Coaſt of Carolina, Virginia, Maryland, Penſilvania, New England, and Newfoundland.				
Charles Town upon Aſhley River	32	45	78	46
Cape Hatteras	35	15	74	20
Cape Henry	37	00	75	24
Cape Charles	37	16	74	16
Cape Hinlopen	38	50	74	56
Long Iſland	40	50	72	45
New York	40	58	73	53
Cape Cod	42	12	68	55
Boſton	42	30	69	23
Cape Sable	43	50	64	58
Iſle Sable	44	20	59	01
Cape Britain	46	00	58	30
Quebec	46	55	69	48
Bay of Breſt	52	10	56	57
Bell Iſland	52	07	55	35
Cape St. John	50	15	52	48
Cape Bonaviſta	49	15	52	12
Trinity Bay Entrance	48	42	52	20
Conception Bay	48	20	52	08
St. John's Harbour	48	00	51	39
Bay of Bulls	47	50	51	29
Cape Race	46	40	51	52
Cape St. Mary	47	10	53	23
Placentia	47	45	53	58
Cape Roy	48	00	57	40

North Latitude. Weſt Longitude.

Places Names.	Latitude		Longit.	
The Coaſt of Hudſon's Bay and Straits.	D.	M.	D.	M.
Buttons Iſle	60	25	66	27
Cape Charles	62	10	75	35
Cape Walſingham	62	35	77	55
Mansfield Iſle	61	42	80	30
Cape Jones	54	55	78	58
Ruperts River	51	30	79	26
Albany River	52	26	84	50
The Cubbs	54	10	82	40
Cape Henrietta Maria	55	07	84	30
Port Nelſon	57	10	93	58
Cape Churchill	59	00	95	20
Cape Southampton	61	55	86	48
Shark Point	64	30	82	55
Nottingham Iſle	63	30	79	53
Queen Ann's Foreland	63	48	74	45
Reſolution Iſle	61	50	65	04
Cape Farewell	59	45	46	45
The Coaſt of Iceland, Greenland, Nova Zembla, and Northern Iſles.				
Sound Royal	66	22	14	33
Bargazar Point	66	20	16	35
Whales Back	65	27	20	33
Merchants Foreland	63	25	17	05
Halliford	64	30	34	43
Fair Foreland	66	20	26	27
Grims Iſland	67	15	22	34
Weſtmania Iſles	63	30	22	24
Iſles of Fero	62	06	05	00
Beerenberg, or John Main's Iſle	71	45	04	30 E
Point Look-out	76	25	15	36 E
Horn Sound	76	45	13	36 E
Fair Foreland	79	20	10	52 E
Hacluits Foreland	79	55	11	00 E
Helies's Sound	78	55	21	50 E

North Latitude. Weſt Longitude.

A TABLE of Latitudes and Longitudes.

Places Names.	Latitude		Longit.	
The Coaſt of Iceland, Greenland, Nova, Zembla, and Northern Iſles.	D.	M.	D.	M.
Lees Foreland	78	05	23	25
Whales Head	77	18	21	30
Hope Iſland	76	18	23	45
Cherry or Bear Iſle	74	30	18	08
Admiralty Iſle	75	05	54	50
Fretum Borough	70	00	61	20
Cape Candinoſe	69	05	42	35
Catnoſe	65	43	35	14
Archangle Bar	64	30	40	30
Croſs Iſland	66	31	36	33
Sweetnoſe	68	10	34	45
Kilduyn	69	30	31	20
North Cape	71	23	23	02
Surroy	71	05	16	40
Tromſound	70	25	15	30
Lœfort SW. Point	68	15	09	30
Dronten	63	50	10	15
Stadland	62	10	04	38
North Bergen	60	10	05	40
Naze of Norway	57	45	07	24

North Latitude. East Longitude.

The Coaſt in the Sound and Baltick.

Mardon	58	19 N	08	57 E
Larwick	58	54 N	09	20 E
Chriſtiana	59	20 N	10	00 E
Maeſterland	57	53 N	11	45 E

Places Names.	Latitude		Longit.	
	D.	M.	D.	M.
Gottenburgh	57	50	12	15
Elſinore	56	22	12	42
Copenhagen	55	41	12	50
Valſterborn	55	28	13	00
Kalmer	56	40	16	35
Stockholm	59	20	19	30
Wybourg	60	52	29	16
Peterſburgh	60	00	30	25
Narva	59	17	28	25
Revel	59	25	24	51
Riga	57	04	25	15
Derwinda	57	15	22	06
Koningſberg	54	43	21	35
Dantzick	54	22	18	36
Wiſby in Gotland	57	30	18	30
Bornholm	55	15	14	45
Straelſound	54	25	13	16
Lubeck	54	06	09	55
Anout	56	50	11	06
Leſou	57	05	10	30
Scaw	57	30	10	20

North Latitude. East Longitude.

The Latitudes of any two Places being given, to find the Difference of Latitude between them.

Rule, If the Latitudes are both North, or both South, ſubtract the Leſs from the Greater, the Remainder will be the Difference of Latitude.

But

But if one Latitude be North, and the other South, then add them together, and their Sum will be the Difference of Latitude.

Example 1ſt. What is the Difference of Latitude between the *Lizard* and *Barbadoes*?

	d.	m.	
Lizard, in Latitude	49	57	N.
Barbadoes, in Latitude	12	58	N.
The Difference of Latitude	36	59	N.

Example 2d. What is the Difference of Latitude between *Jamaica* and Cape *Bona Eſperance*?

Jamaica, in Latitude	17	40	N.
Cape *Bona Eſperance*, in Latitude	34	07	S.
The Difference of Latitude	51	47	which Deg.

being multiplied by 60, and the odd 47 Min. — 60

taken in, will give the Difference of Latitude in — 3107 Miles.

Rules for Latitude.

The Latitude ſail'd from, and the Difference of Latitude being given, to find what Latitude the Ship is come into.

Caſe the 1ſt. When you ſail from North Latitude to the Northward, or from South Latitude to the Southward, add the Difference of Latitude (it being firſt brought into Degrees, if need be, by dividing it by 60) to the Latitude ſail'd from, the Sum will be the Latitude you are come into, of the ſame Name with the Latitude ſail'd from.

Example 1ſt. A Ship from a Place in the Latitude 14 10 N. ſails to the Northwaad till ſhe makes her Difference of Latitude 04 21. What Latitude is ſhe come into?

Latitude ſail'd from	14	10	N.
Difference of Latitude	04	21	
Latitude come into	18	31	N.

Example 2d. A Ship from the Latitude 29 17 S. ſails to the Southward till ſhe makes her Difference of Latitude 374 Miles: What Latitude is ſhe come into?

Latitude ſail'd from	29	17	S.
Difference of Lat. 374 Miles, divided by 60 makes	06	14	
Latitude come into	35	31	S.

Caſe the 2d. When you ſail from North Latitude to the Southward, or from South Latitude to the Northward, ſubtract the Difference of Latitude, if leaſt, from the Latitude ſail'd from, the Remainder is the Latitude come into, of the ſame Name with the Latitude you ſail'd from.

But if the Difference of Latitude be biggeſt, then ſubtract the Latitude from the Difference of Latitude, the Remainder will be the Latude come into, of a contrary Name to the Latitude you ſail'd from.

Example 1ſt. A Ship from Latitude 49 14 N. ſails to the Southward till her Difference of Latitude be 521 Miles. What Latitude is ſhe come into?

Latitude ſail'd from	49 14 N.
Diff. of Lat. 521 Miles, divided by 60, makes	08 41
Latitude come into	40 33 N.

Example 2d. A Ship from Latitude 4 18. S. ſails to the Northward till her Difference of Latitude be 10 24. What Latitude is ſhe come into?

Latitude ſail'd from	04 18 S.
Difference of Latitude	10 24
Latitude come into	06 06 N.

Rules for Longitude.

The Longitudes of any two Places being given, to find the Difference of Longitude between them.

Rule. If the Longitudes are both Eaſt, or both Weſt ſubtract the leſſer from the greater, the Remainder will be the Difference of Longitude.

But if one Longitude be Eaſt, and the other Weſt, then add them together, and their Sum (if leſs than 180 Degrees, will be the Difference of Longitude; but if it be more than 180 Degrees,) then ſubtract it from 360,00, and the Remainder will be the Difference of Longitude.

Example 1ſt. What is the Difference of Longitude between Cape *Finiſterre* and *Antigua*.

Caſe

Cape *Finiſtere*, in Longitude ——— 09 40 W.
Antigua, in Longitude ——— 61 45 W.

The Difference of Longitude ——— 52 05

Example 2d. What is the Difference of Longitude between *Barcelona* and the Rock of *Liſbon*?

Barcelona, in Longitude ——— 02 18 E.
Rock of *Liſbon*, in Longitude ——— 09 50 W.

The Difference of Longitude ——— 12 08

Example 3d. What is the Difference of Longitude between the S. E. Point of *Japan*, and the Iſland of *St. Chriſtopher's*?

S. E. Point of *Japan*, in Longitude —— 140 30 E.
St. *Chriſtopher*'s, in Longitude ——— 62 49 W.

Exceeds 180,00—203 10
Subſtract it from—360 00

Remains the Difference of Longitude—156 50

The Longitude ſailed from, and the Difference of Longitude being given, to find what Longitude the Ship is come into.

Caſe 1ſt. When you ſail from Eaſt Longitude to the Eaſtward, or from Weſt Longitude to the Weſtward, add the Difference of Longitude to the Longitude ſail'd from, the Sum (if leſs than 180 Degrees) is the Longitude come into, of the ſame Name with the Longitude you ſailed from.

But if the Sum ſhould be more than 180 Degrees, then ſubtract it from 360,00, and the Remainder will be the Longitude you are come into, of a contrary Name to the Longitude you ſailed from.

Example 1ſt. A Ship from Longitude of 48 21 Eaſt, ſails to the Eaſtward, till ſhe makes her Difference of Longitude 287 Miles. What Longitude is ſhe come into?

Longitude ſailed from ——— 48 21 E.
Difference of Longitude 287 Miles, or— 04 47

Longitude come into ——— 53 08 E.

Example 2d. A Ship from the Longitude of 178 47 W. ſails to the Weſtward till her Difference of Longitude be 12 17: What Longitude is ſhe come into?

Lon.

Longitude ſailed from	178 47 W.
Difference of Longitude	12 17
Exceeds 180.00	191 04
Subtract it from	360 00
Remains the Longitude come into	168 56 E.

Caſe the 2d. When you ſail from Eaſt Longitude to the Weſtward, or from Weſt Longitude to the Eaſtward, ſubtract the Difference of Longitude (if it be leaſt) from the Longitude you ſailed from, and the Remainder will be the Longitude come into, of the ſame Name with the Longitude ſailed from.

But if the Difference of Longitude be the biggeſt, then ſubtract the Longitude from the Difference of Longitude, and the Remainder will be the Longitude come into, of a contrary Name to the Longitude ſailed from.

Example 1ſt. A Ship from Longitude 98 17 E. ſails to the Weſtward till ſhe makes her Difference of Longitude 14 21: What Longitude is ſhe come into?

Longitude ſailed from	98 17 E.
Difference of Longitude	14 21
Longitude come into	83 56 E.

Example 2d. A Ship from Longitude 44 21 Weſt, ſails to the Eaſtward till her Difference of Longitude be 81 42: What Longitude is ſhe come into?

Longitude ſailed from	44 21 W.
Difference of Longitude	81 42
Longitude come into	37 21 E.

Here follows a Table of Meridional Parts, to every Degree and Minute of Latitude.

M	0 d	1 d	2 d	3 d	4 d	5 d	6 d	7 d	8 d	9 d	10 d	11 d	12 d	13 d	M
0	0	60	120	180	240	300	361	421	482	542	603	664	725	787	0
1	1	61	121	181	241	301	362	422	483	543	604	665	726	788	1
2	2	62	122	182	242	302	363	423	484	544	605	666	727	789	2
3	3	63	123	183	243	303	364	424	485	545	606	667	728	790	3
4	4	64	124	184	244	304	365	425	486	546	607	668	729	791	4
5	5	65	125	185	245	305	366	426	487	547	608	669	730	792	5
6	6	66	126	186	246	306	367	427	488	548	609	670	731	793	6
7	7	67	127	187	247	307	368	428	489	549	610	671	732	794	7
8	8	68	128	188	248	308	369	429	490	550	611	672	733	795	8
9	9	69	129	189	249	309	370	430	491	551	612	673	735	796	9
10	10	70	130	190	250	310	371	431	492	552	613	674	736	797	10
11	11	71	131	191	251	311	372	432	493	553	614	675	737	798	11
12	12	72	132	192	252	312	373	433	494	554	615	676	738	799	12
13	13	73	133	193	253	313	374	434	495	555	616	677	739	800	13
14	14	74	134	194	254	314	375	435	496	556	617	678	740	801	14
15	15	75	135	195	255	315	376	436	497	557	618	679	741	802	15
16	16	76	136	196	256	316	377	437	498	558	619	680	742	803	16
17	17	77	137	197	257	317	378	438	499	559	620	681	743	804	17
18	18	78	138	198	258	318	379	439	500	560	621	682	744	805	18
19	19	79	139	199	259	319	380	440	501	561	622	683	745	806	19
20	20	80	140	200	260	320	381	441	502	622	623	684	746	807	20
21	21	81	141	201	261	321	382	442	503	563	624	685	747	808	21
22	22	82	142	202	262	322	383	443	504	564	625	686	748	809	22
23	23	83	143	203	263	323	384	444	505	566	626	688	749	810	23
24	24	84	144	204	264	324	385	445	506	567	627	689	750	811	24
25	25	85	145	205	265	325	386	446	507	568	628	690	751	812	25
26	26	86	146	206	266	326	387	447	508	569	629	691	752	813	26
27	27	87	147	207	267	327	388	448	509	570	630	692	753	814	27
28	28	88	148	208	268	328	389	449	510	571	632	693	754	816	28
29	29	89	149	209	269	329	390	450	511	572	633	694	755	817	29
30	30	90	150	210	270	330	391	451	512	573	634	695	756	818	30
31	31	91	151	211	271	332	392	452	513	574	635	696	757	819	31
32	32	92	152	212	272	333	393	453	514	575	636	697	758	820	32
33	33	93	153	213	273	334	394	454	515	576	637	698	759	821	33
34	34	94	154	214	274	335	395	455	516	577	638	699	760	822	34
35	35	95	155	215	275	336	396	456	517	578	639	700	761	823	35
36	36	96	156	216	276	337	397	457	518	579	640	701	762	824	36
37	37	97	157	217	277	338	398	458	519	580	641	702	763	825	37
38	38	98	158	218	278	339	399	459	520	581	642	703	764	826	38
39	39	99	159	219	279	340	400	460	521	582	643	704	765	827	39
40	40	100	160	220	280	341	401	461	522	583	644	705	766	828	40
41	41	101	161	221	281	342	402	462	523	584	645	706	767	829	41
42	42	102	162	222	282	343	403	463	524	585	646	707	768	830	42
43	43	103	163	223	283	344	404	464	525	586	647	708	769	831	43
44	44	104	164	224	284	345	405	465	526	587	648	709	770	832	44
45	45	105	165	225	285	346	406	466	527	588	649	710	771	833	45
46	46	106	166	226	286	347	407	667	528	589	650	711	772	834	46
47	47	107	167	227	287	348	408	468	529	590	651	712	773	835	47
48	48	108	168	228	288	349	409	469	530	591	652	713	774	836	48
49	49	109	169	229	289	350	410	470	531	592	653	714	775	837	49
50	50	110	170	230	290	351	411	471	532	593	654	715	776	838	50
51	51	111	171	231	291	352	412	472	533	594	655	716	777	839	51
52	52	112	172	232	292	353	413	473	534	595	656	717	779	840	52
53	53	113	173	233	293	354	414	474	535	596	657	718	780	841	53
54	54	114	174	234	294	355	415	475	536	597	658	719	781	842	54
55	55	115	175	235	295	356	416	477	537	598	659	720	782	843	55
56	56	116	176	236	296	357	417	478	538	599	660	721	783	844	56
57	57	117	177	237	297	358	418	479	539	600	661	722	784	845	57
58	58	118	178	238	298	359	419	480	540	601	662	723	785	846	58
59	59	119	179	239	299	360	420	481	541	602	663	724	786	847	59

M	14 d	15 d	16 d	17 d	18 d	19 d	20 d	21 d	22 d	23 d	24 d	25 d	26 d	27 d	M
0	848	910	973	1035	1098	1161	225	1289	1354	1419	1484	1550	1616	1684	0
1	849	911	974	36	99	63	26	90	55	20	85	51	18	85	1
2	851	913	975	37	1100	64	27	91	56	21	86	52	19	86	2
3	852	914	976	38	01	65	28	92	57	22	87	53	20	87	3
4	853	915	977	39	02	66	29	53	58	23	88	54	21	88	4
5	854	916	978	41	03	67	30	95	59	24	90	56	22	89	5
6	855	917	979	42	05	68	32	96	60	25	91	57	23	90	6
7	856	918	980	43	06	69	33	97	61	26	92	58	24	91	7
8	857	919	981	44	07	70	34	98	62	27	93	59	25	93	8
9	858	920	982	45	08	71	35	99	63	28	94	60	26	94	9
10	859	921	983	1046	1109	1172	1236	1300	1364	1429	1495	1561	1628	1695	10
11	860	922	984	47	10	73	37	01	66	31	96	62	29	96	11
12	861	923	985	48	11	74	38	02	67	32	97	63	30	97	12
13	862	924	986	49	12	75	39	03	68	33	98	64	31	98	13
14	863	925	987	50	13	76	40	04	69	34	99	65	32	99	14
15	864	926	988	51	14	77	41	05	70	35	1500	67	33	1700	15
16	865	927	989	52	15	78	42	06	71	36	02	68	34	01	16
17	866	928	990	53	16	79	43	07	72	37	03	69	35	03	17
18	867	929	991	54	17	81	44	08	73	38	04	70	37	04	18
19	868	930	992	55	18	82	45	10	74	39	05	71	38	05	19
20	869	931	994	056	1119	1183	1246	1311	1375	1440	1506	1572	1639	1706	20
21	870	932	995	57	20	84	48	12	76	41	07	73	40	07	21
22	871	933	996	58	21	85	49	13	77	43	08	74	41	08	22
23	872	934	997	59	22	86	50	14	79	44	09	75	42	09	23
24	873	935	998	60	23	87	51	15	80	45	10	77	43	10	24
25	874	936	999	61	25	88	52	16	81	46	11	78	44	12	25
26	875	937	1000	63	26	89	53	17	82	47	13	79	45	13	26
27	876	938	1001	64	27	90	54	18	83	48	14	80	47	14	27
28	877	939	1002	65	28	91	55	19	84	49	15	81	48	15	28
29	878	941	1003	66	29	92	56	20	85	50	16	82	49	16	29
30	879	942	1004	1067	1130	1193	1257	1321	1386	1451	1517	1583	1650	1717	30
31	880	943	05	68	31	94	58	22	87	52	18	84	51	18	31
32	881	944	06	69	32	95	59	24	88	53	19	85	52	20	32
33	883	945	07	70	33	96	60	25	89	55	20	86	53	21	33
34	884	946	08	71	34	97	61	26	90	56	21	88	54	22	34
35	885	947	09	72	35	99	62	27	92	57	22	89	56	23	35
36	886	948	10	73	36	1200	64	28	93	58	24	90	57	24	36
37	887	949	11	74	37	01	65	29	94	59	25	91	58	25	37
38	888	950	12	75	38	02	66	30	95	60	26	92	59	26	38
39	889	951	13	76	39	03	67	31	96	61	27	93	60	27	39
40	890	952	1014	1077	1140	1204	1268	1332	1397	1462	1528	1594	1661	1729	40
41	891	953	15	78	41	05	69	33	98	63	29	95	62	30	41
42	892	954	16	79	42	06	70	34	99	64	30	96	63	31	42
43	893	955	18	80	44	07	71	35	1400	65	31	98	64	32	43
44	894	956	19	81	45	08	72	36	01	67	32	99	66	33	44
45	895	957	20	82	46	09	73	38	02	68	33	1600	67	34	45
46	896	958	21	83	47	10	74	39	03	69	35	01	68	35	46
47	897	959	22	85	48	11	75	40	05	70	36	02	69	36	47
48	898	960	23	86	49	12	76	41	06	71	37	03	70	38	48
49	899	961	24	87	50	13	77	42	07	72	38	04	71	39	49
50	900	962	1025	1088	1151	214	1278	1343	1408	1473	1539	1605	1672	1740	50
51	901	963	26	89	52	16	80	44	09	74	40	06	73	41	51
52	902	964	27	90	53	17	81	45	10	75	41	08	75	42	52
53	903	965	28	91	54	18	82	46	11	76	42	09	76	43	53
54	904	966	29	92	55	19	83	47	12	77	43	10	77	44	54
55	905	968	30	93	56	20	84	48	13	79	44	11	78	45	55
56	906	969	31	94	57	21	85	49	1.	80	46	12	79	47	56
57	907	970	32	95	58	22	86	50	15	81	47	13	80	48	57
58	908	971	33	96	59	23	87	52	16	82	48	14	81	49	58
59	909	972	34	97	60	24	88	53	18	83	49	15	82	50	59

M	28 d	29 d	30 d	31 d	32 d	33 d	34 d	35 d	36 d	37 d	38 d	39 d	40 d	41 d	M
0	1751	1819	1888	1958	2028	2100	2171	2244	2318	2393	2468	2545	2623	2702	0
1	52	21	90	59	30	01	73	45	19	94	70	46	24	03	1
2	53	22	91	60	31	02	74	47	20	95	71	48	25	04	2
3	55	23	92	62	32	03	75	48	22	96	72	49	27	06	3
4	56	24	93	63	33	04	76	49	23	98	73	50	28	07	4
5	57	25	94	64	34	05	78	50	24	99	75	51	29	08	5
6	58	26	95	65	35	07	79	52	25	2400	76	53	31	10	6
7	59	27	96	66	37	08	80	53	27	01	77	54	32	11	7
8	60	29	98	67	38	09	81	54	28	03	78	55	33	12	8
9	61	30	99	69	39	10	82	55	29	04	80	57	34	14	9
10	1762	1831	1900	1970	2040	2111	2184	2256	2330	2405	2481	2558	2636	2715	10
11	64	32	01	71	41	13	85	58	32	06	82	59	37	16	11
12	65	33	02	72	43	14	86	59	33	08	84	60	38	18	12
13	66	34	03	73	44	15	87	60	34	09	85	62	40	19	13
14	67	35	05	74	45	16	88	61	35	10	86	63	41	20	14
15	68	37	06	76	46	17	90	63	37	11	87	64	42	22	15
16	69	38	07	77	47	19	91	64	38	13	89	66	44	23	16
17	70	39	08	78	48	20	92	65	39	14	90	67	45	24	17
18	72	40	09	79	50	21	93	66	40	15	91	68	46	26	18
19	73	41	10	80	51	22	94	68	42	16	92	69	48	27	19
20	1774	1842	1911	1981	2052	2123	2196	2269	2343	2418	2494	2571	2649	2728	20
21	75	43	13	83	53	25	97	70	44	19	95	72	50	29	21
22	76	45	14	84	54	26	98	71	45	20	96	73	51	31	22
23	77	46	15	85	56	27	99	72	46	21	98	75	53	32	23
24	78	47	16	86	57	28	2200	74	48	23	99	76	54	33	24
25	80	48	17	87	58	29	02	75	49	24	2500	77	55	35	25
26	81	49	18	88	59	31	03	76	50	25	01	78	57	36	26
27	82	50	20	90	60	32	04	77	51	27	03	80	58	37	27
28	83	52	21	91	61	33	05	79	53	28	04	81	59	39	28
29	84	53	22	92	63	34	07	80	54	29	05	82	61	40	29
30	1785	1854	1923	1993	2064	2135	2208	2281	2355	2430	2506	2584	2662	2742	30
31	86	55	24	94	65	37	09	82	56	32	08	85	63	43	33
32	87	56	25	95	66	38	10	83	58	33	09	86	65	44	33
33	89	57	27	97	67	39	11	85	59	34	10	88	66	46	34
34	90	58	28	98	69	40	13	86	60	35	12	89	67	47	35
35	91	60	29	99	70	41	14	87	61	37	13	90	69	48	36
36	92	61	30	2000	71	43	15	88	63	38	14	91	70	50	37
37	93	62	31	01	72	44	16	90	64	39	15	93	71	51	87
38	94	63	32	02	73	45	17	91	65	40	17	94	73	52	98
39	95	64	34	04	75	46	19	92	66	42	18	95	74	54	27
40	1797	1865	1935	2005	2076	2147	2220	2293	2368	2443	2519	2597	2675	2755	40
41	98	66	36	06	77	49	21	95	69	44	21	98	76	56	41
42	99	68	37	07	78	50	22	96	70	45	22	99	78	58	42
43	1800	69	38	08	79	51	24	97	71	47	23	2601	79	59	43
44	01	70	39	10	80	52	25	98	73	48	24	02	80	60	44
45	02	71	41	11	82	53	26	99	74	49	26	03	82	62	45
46	03	72	42	12	83	55	27	2301	75	51	27	04	83	63	46
47	05	73	43	13	84	56	28	02	76	52	28	06	84	64	47
48	06	75	44	14	85	57	30	03	78	53	30	07	86	66	48
49	07	76	45	15	86	58	31	04	79	54	31	08	87	67	49
50	1808	1877	1946	2017	2088	2159	2232	2306	2380	2456	2532	2610	2688	2768	50
51	09	78	48	18	89	61	33	07	81	57	33	11	90	70	51
52	10	79	49	19	90	62	35	08	83	58	35	12	91	71	52
53	11	80	50	20	91	63	36	09	84	59	36	14	92	72	53
54	13	81	51	21	92	64	37	11	85	61	37	15	94	74	54
55	14	83	52	22	94	65	38	12	86	62	38	16	95	75	55
56	15	84	53	24	95	67	39	13	88	63	40	17	96	76	56
57	16	85	55	25	96	68	41	14	89	64	41	19	98	78	57
58	17	86	56	26	97	69	42	16	90	66	42	20	99	79	58
59	18	87	57	27	98	70	43	17	91	67	44	21	2700	80	59

M	42 d	43 d	44 d	45 d	46 d	47 d	48 d	49 d	50 d	51 d	52 d	53 d	54 d	55 d	M
0	2782	2863	2946	3030	3116	203	3292	3382	3474	3569	3665	3764	3865	3968	0
1	83	64	47	31	17	04	93	84	76	70	67	65	66	70	1
2	84	66	49	33	18	06	95	85	78	72	68	67	68	71	2
3	86	67	50	34	20	07	96	87	79	74	70	69	70	73	3
4	87	69	51	36	21	09	98	88	81	75	72	70	71	75	4
5	88	70	53	37	23	10	99	90	82	77	73	72	73	77	5
6	90	71	54	38	24	12	3301	91	84	78	75	74	75	78	6
7	91	73	56	40	26	13	02	93	85	80	77	75	77	80	7
8	92	74	57	41	27	14	03	94	87	82	78	77	78	82	8
9	94	75	58	43	29	16	05	96	88	83	80	79	80	84	9
10	2795	2877	2960	3044	3130	3217	3306	3397	3490	3585	3681	3780	3882	3985	10
11	97	78	61	46	31	19	08	99	92	86	83	82	83	87	11
12	98	80	63	47	33	20	09	3400	93	88	85	84	85	89	12
13	99	81	64	48	34	22	11	02	95	90	86	85	87	91	13
14	2801	82	65	50	36	23	12	03	96	91	88	87	89	92	14
15	02	84	67	51	37	25	14	05	98	93	90	89	90	94	15
16	03	85	68	53	39	26	16	07	99	94	91	90	92	96	16
17	05	86	70	54	40	28	17	08	3501	96	93	92	94	98	17
18	06	88	71	55	42	29	19	10	03	98	95	94	95	99	18
19	07	89	72	57	43	31	20	11	04	99	96	95	97	4001	19
20	2809	2891	2974	3058	3144	3232	3322	3413	3506	3601	3698	3797	99	4003	20
21	10	92	75	60	46	34	23	14	07	02	99	99	3901	05	21
22	11	93	76	61	47	35	25	16	09	04	3701	3800	02	06	22
23	13	95	78	63	49	37	26	17	10	06	03	02	04	08	23
24	14	96	79	64	50	38	28	19	12	07	04	04	06	10	24
25	15	97	81	65	52	40	29	20	14	09	06	06	07	12	25
26	17	99	82	67	53	41	31	22	15	10	08	07	09	14	26
27	18	2900	83	68	55	42	32	23	17	12	09	09	11	15	27
28	20	02	85	70	56	44	34	25	18	14	11	11	13	17	28
29	21	03	86	71	57	45	35	27	20	15	13	12	14	19	29
30	2822	2904	2988	3073	3159	3247	3337	3428	3521	3617	3714	3814	3916	4021	30
31	24	06	89	74	60	48	38	30	23	18	16	16	18	22	31
32	25	07	91	75	62	50	40	31	25	20	17	17	19	24	32
33	26	08	92	77	63	51	41	33	26	22	19	19	21	26	33
34	28	10	93	78	65	53	43	34	28	23	21	21	23	28	34
35	29	11	95	80	66	54	44	36	29	25	22	22	25	29	35
36	30	13	96	81	68	56	46	37	31	26	24	24	26	31	36
37	32	14	98	83	69	57	47	39	32	28	26	26	28	33	37
38	33	15	99	84	71	59	49	40	34	30	27	27	30	35	38
39	34	17	3000	85	72	60	50	42	36	31	29	29	32	37	39
40	2836	2918	3002	3087	3173	3262	3352	3443	3537	3633	3731	3831	3933	4038	40
41	37	19	03	88	75	63	53	45	39	34	32	32	35	40	41
42	39	21	05	90	76	65	55	47	40	36	34	34	37	42	42
43	40	22	06	91	78	66	56	48	42	38	36	36	38	44	43
44	41	24	07	93	79	68	58	50	43	39	37	38	40	45	44
45	43	25	09	94	81	69	59	51	45	41	39	39	42	47	45
46	44	26	10	95	82	71	61	53	47	43	41	41	44	49	46
47	45	28	12	97	84	72	62	54	48	44	42	43	45	51	47
48	47	29	13	98	85	74	64	56	50	46	44	44	47	52	48
49	48	31	14	3100	87	75	65	57	51	47	46	46	49	54	49
50	2849	2932	3016	3101	3188	3277	3367	3459	3553	3649	3747	3848	3951	4056	50
51	51	33	17	03	90	78	68	60	55	51	49	49	52	58	51
52	52	35	19	04	91	80	70	62	56	52	50	51	54	60	52
53	54	36	20	05	92	81	71	64	58	54	52	53	56	61	53
54	55	37	21	07	94	83	73	65	59	55	54	54	58	63	54
55	56	39	23	08	95	84	74	67	60	57	55	56	59	65	55
56	58	40	24	10	97	86	76	68	62	59	57	58	61	67	56
57	59	42	26	11	98	87	78	70	64	60	59	60	63	69	57
58	60	43	27	13	3200	89	79	71	65	62	60	61	64	70	58
59	62	44	28	14	01	90	81	73	77	64	62	63	66	72	59

M	56 d	57 d	58 d	59 d	60 d	61 d	62 d	63 d	64 d	65 d	66 d	67 d	68 d	69 d	M
0	4074	4183	4294	4409	4527	4649	4775	4905	5039	5179	5324	5474	5631	5795	0
1	76	84	96	11	29	51	77	07	42	81	26	77	33	97	1
2	77	86	98	13	31	53	79	09	44	84	28	79	36	5800	2
3	79	88	4300	15	33	55	81	12	46	86	31	82	39	03	3
4	81	90	02	17	35	57	84	14	49	88	33	84	41	06	4
5	83	92	04	19	37	60	86	16	51	91	36	87	44	09	5
6	85	94	06	21	39	62	88	18	53	93	38	89	47	10	6
7	86	95	08	23	41	64	90	20	55	95	41	92	50	14	7
8	88	97	09	25	43	66	92	23	58	98	43	95	53	17	8
9	90	99	11	27	45	68	94	25	60	5200	46	97	55	20	9
10	4092	4201	4313	4429	4547	4670	4796	4927	5062	5203	5348	5500	5658	5823	10
11	94	03	15	31	49	72	98	29	65	05	51	02	60	25	11
12	95	05	17	33	51	74	4801	31	67	07	53	05	63	28	12
13	97	07	19	34	53	76	03	34	69	10	56	07	66	31	13
14	99	08	21	36	55	78	05	36	71	12	58	10	68	34	14
15	4101	10	23	38	57	80	07	38	74	14	61	13	71	37	15
16	03	12	25	40	59	82	09	40	76	17	63	15	74	39	16
17	04	14	27	42	62	84	11	43	78	19	66	18	76	42	17
18	06	16	28	44	64	87	14	45	81	22	68	20	79	45	18
19	08	18	30	46	66	89	16	47	83	24	71	23	82	48	19
20	4110	4220	4332	4448	4568	4691	4818	4949	5085	5226	5373	5526	5685	5851	20
21	12	21	34	50	70	93	20	51	88	29	76	28	87	54	21
22	13	23	36	52	72	95	22	54	90	31	78	31	90	56	22
23	15	25	38	54	74	97	24	56	92	34	80	33	93	59	23
24	17	27	40	56	76	99	26	58	95	36	83	36	95	62	24
25	19	29	42	58	78	4701	29	60	97	38	85	39	98	65	25
26	21	31	44	60	80	03	31	63	99	41	88	41	5701	68	26
27	22	32	46	62	82	05	33	65	5102	43	90	44	04	71	27
28	24	34	47	64	84	07	35	67	04	46	93	46	06	74	28
29	26	36	49	66	86	10	37	69	06	48	95	49	09	76	29
30	4128	4238	4351	4468	4588	4712	4839	4972	5108	5250	5398	5552	5712	5879	30
31	30	40	53	70	90	14	42	74	11	53	5401	54	15	82	31
32	32	42	55	72	92	16	44	76	13	55	03	57	17	85	32
33	33	44	57	74	94	18	46	78	15	58	06	59	20	88	33
34	35	46	59	76	96	20	48	81	18	60	08	62	23	91	34
35	37	47	61	78	98	22	50	83	20	63	11	65	25	94	35
36	39	49	63	80	4600	24	52	85	22	65	13	67	28	96	36
37	41	51	65	82	02	26	55	87	25	67	16	70	31	99	37
38	42	53	67	84	04	28	57	90	27	70	18	73	34	5902	38
39	44	55	69	86	06	31	59	92	29	72	21	75	36	05	39
40	4146	4257	4370	4488	4608	4733	4861	4994	5132	5275	5423	5578	5739	5908	40
41	48	59	72	90	10	35	63	96	34	77	26	80	42	11	41
42	50	60	74	92	12	37	65	99	36	80	28	83	45	14	42
43	52	62	76	94	14	39	68	5001	39	82	31	86	47	17	43
44	53	64	78	95	16	41	70	03	41	84	33	88	50	19	44
45	55	66	80	97	18	43	72	05	43	87	36	91	53	22	45
46	57	68	82	99	20	45	74	08	46	89	38	94	56	25	46
47	59	70	84	4501	23	47	76	10	48	92	41	96	58	28	47
48	61	72	86	03	25	50	79	12	51	94	43	99	61	31	48
49	62	74	88	05	27	52	81	14	53	97	46	5602	64	34	49
50	4164	4275	4390	4507	4629	4754	4883	5017	5155	5299	5448	5604	5767	5937	50
51	66	77	92	09	31	56	85	19	58	5301	51	07	70	40	51
52	68	79	94	11	33	58	87	21	60	04	54	10	72	43	52
53	70	81	96	13	35	60	90	23	62	06	56	12	75	46	53
54	72	83	98	15	37	62	92	26	65	09	59	15	78	48	54
55	73	85	99	17	39	64	94	28	67	11	61	17	81	51	55
56	75	87	4401	19	41	66	96	30	69	14	64	20	83	54	56
57	77	89	03	21	43	69	98	33	72	16	66	23	86	57	57
58	79	91	05	23	45	71	4901	35	74	19	69	25	89	60	58
59	81	92	07	25	47	73	03	37	76	21	71	28	92	63	59

M	70 d	71 d	72 d	73 d	74 d	75 d	76 d	77 d	78 d	79 d	80 d	81 d	82 d	83 d	M
0	5966	6146	6335	6534	6746	6970	7210	7467	7745	8046	8375	8739	9145	9606	0
1	69	49	38	38	49	74	14	72	49	51	81	45	53	14	1
2	72	52	41	41	53	78	18	76	54	56	87	52	60	22	2
3	75	55	45	45	57	82	22	81	59	61	93	58	67	31	3
4	78	58	48	49	60	86	27	85	64	67	98	65	74	39	4
5	81	61	51	52	64	90	31	90	69	72	8404	71	82	47	5
6	84	64	54	55	68	94	35	94	74	77	10	78	89	55	6
7	86	67	58	58	71	97	39	98	78	83	16	84	96	64	7
8	89	70	61	62	75	7001	43	7503	83	88	22	91	9203	72	8
9	92	73	64	65	79	05	47	07	88	93	27	97	11	80	9
10	5995	6177	6367	6569	6782	7009	7252	7512	7793	8099	8433	8804	9218	9689	10
11	98	80	71	72	86	13	56	16	98	8104	39	10	25	97	11
12	6001	83	74	76	90	17	60	21	7803	09	45	17	33	9706	12
13	04	86	77	79	93	21	64	25	08	15	51	23	40	14	13
14	07	89	80	83	97	25	68	30	13	20	57	30	48	23	14
15	10	92	84	86	6801	29	73	35	17	25	63	36	55	31	15
16	13	95	87	90	04	33	77	39	22	31	69	43	62	40	16
17	16	98	90	93	08	37	81	44	27	36	74	49	70	48	17
18	19	6201	94	97	12	41	85	48	32	41	80	56	77	57	18
19	22	05	97	6600	15	45	89	53	37	47	86	63	85	65	19
20	6025	6208	6400	6603	6819	7048	7294	7557	7842	8152	8492	8869	9292	9774	20
21	28	11	03	07	23	52	98	62	47	58	98	76	9300	83	21
22	31	14	07	10	26	56	7302	66	52	63	8504	83	07	91	22
23	34	17	10	14	30	60	06	71	57	68	10	89	15	9800	23
24	37	20	13	17	34	64	11	76	62	74	16	96	22	09	24
25	40	23	17	21	38	68	15	80	67	79	22	8903	30	17	25
26	43	26	20	24	41	72	19	85	72	85	28	09	37	26	26
27	46	30	23	28	45	76	23	89	77	90	34	16	45	35	27
28	49	33	27	31	49	80	28	94	82	96	40	23	53	44	28
29	52	36	30	35	53	84	32	99	87	8201	46	30	60	52	29
30	6055	6239	6433	6639	6856	7088	7336	7603	7892	8207	8552	8936	9368	9861	30
31	58	42	37	42	60	92	41	08	97	12	58	43	76	70	31
32	61	45	40	46	64	96	45	12	7902	18	65	50	83	79	32
33	64	49	43	49	68	7100	49	17	07	23	71	57	91	88	33
34	67	52	47	53	71	04	53	22	12	29	77	63	99	97	34
35	70	55	50	56	75	08	58	26	17	34	83	70	9407	9906	35
36	73	58	53	60	79	12	62	31	22	40	89	77	14	15	36
37	76	61	57	63	83	16	66	36	27	45	95	84	22	24	37
38	79	64	60	67	86	20	71	40	32	51	8601	91	30	33	38
39	82	68	63	70	90	24	75	45	37	56	07	98	38	42	39
40	6085	6271	6467	6674	6894	7128	7379	7650	7942	8262	8614	9005	9445	9951	40
41	88	74	70	77	98	32	84	54	48	67	20	12	53	59	41
42	91	77	73	81	6901	36	88	59	53	73	26	18	61	69	42
43	94	80	77	85	05	40	92	64	58	79	32	25	69	78	43
44	97	83	80	88	09	45	97	68	63	84	38	32	77	87	44
45	6100	87	83	92	13	49	7401	73	68	90	44	39	85	9996	45
46	03	90	87	95	17	53	06	78	73	95	51	46	93	10005	46
47	06	93	90	99	20	57	10	83	78	8301	57	53	9501	10015	47
48	09	96	94	6702	24	61	14	87	83	07	63	60	09	10024	48
49	12	99	97	06	28	65	19	92	89	12	69	67	17	10033	49
50	6115	6303	6500	6710	6932	7169	7423	7697	7994	8318	8676	9074	9525	10043	50
51	18	06	04	13	36	73	27	7702	99	24	82	81	33	10052	51
52	21	09	07	17	40	77	32	06	8004	29	88	88	41	10061	52
53	24	12	11	20	43	81	36	11	09	35	95	96	49	10071	53
54	27	15	14	24	47	85	41	16	14	41	8701	9103	57	10080	54
55	30	19	17	28	51	89	45	21	20	47	07	10	65	10089	55
56	33	22	21	31	55	94	49	25	25	52	14	17	73	10099	56
57	36	25	24	35	59	98	54	30	30	58	20	24	81	10108	57
58	40	28	28	38	63	7202	58	35	35	64	26	31	89	10118	58
59	43	32	31	42	66	06	63	40	40	69	33	38	98	10127	59

M	84 d	85 d	86 d	87 d	88 d	89 d	M
0	10137	10705	11533	12522	13916	16300	0
1	147	776	547	541	945	357	1
2	157	788	561	561	974	416	2
3	166	799	576	580	14003	476	3
4	175	811	590	599	033	537	4
5	185	822	605	619	063	599	5
6	195	834	620	639	093	662	6
7	205	846	634	659	123	726	7
8	214	858	649	679	154	7,2	8
9	224	860	664	699	184	858	9
10	10234	10881	11679	12719	14216	16926	10
11	244	893	694	739	247	996	11
12	254	905	709	759	279	17067	12
13	264	917	724	780	311	139	13
14	273	929	739	801	343	213	14
15	283	941	755	821	376	289	15
16	293	953	770	842	408	366	16
17	303	965	785	863	442	445	17
18	314	978	801	884	475	526	18
19	324	990	816	906	509	609	19
20	10334	11002	11832	12927	14543	17693	20
21	344	014	848	949	578	781	21
22	354	027	863	970	613	870	22
23	364	039	879	992	648	962	23
24	374	052	895	13014	684	18056	24
25	385	064	911	036	720	153	25
26	395	077	927	059	756	252	26
27	405	089	943	081	793	355	27
28	416	102	959	104	830	461	28
29	426	115	976	126	868	570	29
30	10437	11127	11992	13149	14906	18682	30
31	447	140	12008	172	943	799	31
32	457	153	025	195	983	920	32
33	468	166	041	219	15022	19045	33
34	478	179	058	242	062	174	34
35	489	192	075	266	102	309	35
36	500	205	092	290	143	450	36
37	510	218	109	314	184	596	37
38	521	231	126	338	226	749	38
39	532	244	143	362	268	909	39
40	10542	11257	12160	13386	15311	20076	40
41	553	270	177	411	354	253	41
42	564	284	194	437	398	439	42
43	575	297	212	461	442	635	43
44	586	310	229	486	487	843	44
45	597	324	247	511	532	21065	45
46	608	337	264	537	579	303	46
47	619	351	282	563	625	557	47
48	630	365	300	589	673	832	49
49	641	378	318	615	721	22132	49
50	10652	11392	12336	13641	15770	22459	50
51	663	406	354	668	819	22821	51
52	674	420	373	695	869	23226	52
53	685	434	391	721	920	23685	53
54	696	448	409	749	972	24215	54
55	708	462	428	776	16024	24842	55
56	719	476	447	804	078	25609	56
57	730	490	465	832	132	26598	57
58	742	504	484	860	187	27992	58
59	753	518	503	888	243	30375	59

The Use of the Table *of* Meridional Parts.

IN this Table the firſt and laſt Column of every Page mark'd M, beginning at 0, and ending at 59, contain the Minutes anſwering to every Degree of Latitude, the other Columns mark'd 1d, 2d, *&c.* contain the Meridional Parts, anſwering to the Degree of Latitude they ſtand under.

So that if you would find the Meridional Parts anſwering to any Latitude, ſuppoſe for Example, the Latitude 51,32, look in the Column under 51d. and right againſt 32 (in the Column for Minutes) you will find 20, to which prefix 36, the two Figures in the ſame Column that ſtand above 20 towards the Left-Hand, and it makes 3620, the Meridional Parts required.

Two Latitudes being given, to find the Meridional Difference of Latitude.

Caſe 1ſt, If both Latitudes be North or both South, ſubtract the Meridional Parts of the Leſſer, from the Meridional Parts of the Greater, the Remainder will be the Meridional Difference of Latitude.

Caſe 2d. If one Latitude be North and the other South, then add their Meridional Parts together, and the Sum will be the Meridional Difference of Latitude.

A TABLE of Amplitudes, from the Latitude 00 deg. 00 min. to the Latitnde 12 deg. either North or South.

Degrees of Declination.	The Degrees of Latitude.											
	1	2	3	4	5	6	7	8	9	10	11	12
	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M
0	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00
1	01 00	01 00	01 00	01 00	01 00	01 00	01 00	01 00	01 00	01 01	01 01	01 01
2	02 00	02 00	02 00	02 00	02 00	02 00	02 01	02 01	02 01	02 02	02 02	02 02
3	03 00	03 00	03 00	03 00	03 00	03 01	03 01	03 02	03 02	03 03	03 03	03 03
4	04 00	04 00	04 00	04 00	04 01	04 01	04 02	04 03	04 03	04 04	04 04	04 04
5	05 00	05 00	05 00	05 01	05 01	05 01	05 02	05 03	05 03	05 05	05 05	05 07
6	06 00	06 00	06 00	06 01	06 01	06 02	06 02	06 03	06 04	06 06	06 07	06 08
7	07 00	07 00	07 01	07 01	07 02	07 02	07 03	07 04	07 05	07 07	07 07	07 09
8	08 00	08 00	08 01	08 01	08 02	08 02	08 03	08 04	08 06	08 08	08 09	08 11
9	09 00	09 00	09 01	09 01	09 02	09 03	09 04	09 05	09 07	09 09	09 10	09 12
10	10 00	10 00	10 01	10 01	10 02	10 03	10 04	10 05	10 07	10 10	10 11	10 13
11	11 00	11 00	11 01	11 01	11 03	11 03	11 05	11 06	11 08	11 11	11 12	11 15
12	12 00	12 00	12 01	12 01	12 03	12 04	12 05	12 07	12 09	12 12	12 13	12 16
13	13 00	13 00	13 01	13 02	13 03	13 04	13 06	13 08	13 10	13 13	13 15	13 18
14	14 00	14 00	14 01	14 02	14 03	14 04	14 06	14 09	14 10	14 14	14 16	14 19
15	15 00	15 00	15 01	15 02	15 04	15 05	15 07	15 09	15 11	15 15	15 17	15 21
16	16 00	16 01	16 01	16 02	16 04	16 05	16 07	16 09	16 12	16 16	16 18	16 22
17	17 00	17 01	17 01	17 02	17 04	17 05	17 08	17 10	17 13	17 17	17 20	17 23
18	18 00	18 01	18 01	18 02	18 04	18 06	18 08	18 11	18 14	18 18	18 21	18 25
19	19 00	19 01	19 01	19 03	19 04	19 06	19 09	19 11	19 15	19 19	19 22	19 26
20	20 00	20 01	20 02	20 04	20 05	20 07	20 09	20 12	20 16	20 20	20 24	20 28
21	21 00	21 01	21 02	21 03	21 05	21 07	21 10	21 13	21 17	21 21	21 25	21 29
22	22 00	22 01	22 02	22 03	22 05	22 07	22 10	22 13	22 17	22 22	22 26	22 31
23	23 00	23 01	23 02	23 02	23 05	23 08	23 11	23 14	23 18	23 23	23 28	23 33
23,29	23 29	23 30	23 31	23 03	23 25	23 38	23 40	23 44	23 49	23 54	23 57	24 02

A TABLE of Amplitudes, from the Latitude 13 Deg. 00 Min. to the Latitude 24 Deg. either North or South.

Degrees of Declination.	The Degrees of Latitude.											
	13	14	15	16	17	18	19	20	21	22	23	24
	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M
0	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00
1	01 02	01 02	01 02	01 02	01 02	01 03	01 03	01 04	01 04	01 04	01 05	01 05
2	02 03	02 03	02 04	02 05	02 05	02 06	02 07	02 08	02 08	02 09	02 10	02 11
3	03 05	03 05	03 06	03 07	03 08	03 09	03 10	03 12	03 13	03 14	03 15	03 17
4	04 06	04 07	04 08	04 10	04 11	04 12	04 13	04 15	04 17	04 19	04 21	04 23
5	05 08	05 09	05 11	05 12	05 13	05 15	05 17	05 19	05 21	05 23	05 26	05 28
6	06 10	06 11	06 13	06 15	06 16	06 19	06 21	06 23	06 26	06 28	06 31	06 34
7	07 11	07 13	07 15	07 17	07 19	07 22	07 24	07 37	07 30	07 33	07 37	07 40
8	08 12	08 15	08 17	08 19	08 22	08 25	08 28	08 31	08 34	08 38	08 42	08 45
9	09 14	09 17	09 19	09 22	09 25	09 28	09 31	09 35	09 39	09 43	09 47	09 51
10	10 15	10 18	10 21	10 24	10 27	10 30	10 34	10 38	10 43	10 47	10 52	10 57
11	11 17	11 20	11 23	11 27	11 30	11 34	11 38	11 43	11 48	11 52	11 58	12 03
12	12 19	12 22	12 25	12 29	12 33	12 38	12 42	12 47	12 52	12 57	13 03	13 10
13	13 21	13 24	13 28	13 32	13 36	13 41	13 47	13 52	13 58	14 04	14 10	14 17
14	14 22	14 26	14 30	14 34	14 39	14 44	14 50	14 55	15 01	15 07	15 14	15 21
15	15 24	15 28	15 32	15 37	15 42	15 47	15 53	16 00	16 05	16 12	16 19	16 27
16	16 26	16 30	16 35	16 40	16 45	16 51	16 57	17 03	17 10	17 18	17 25	17 34
17	17 28	17 32	17 37	17 42	17 48	17 54	18 01	18 07	18 15	18 23	18 31	18 40
18	18 30	18 34	18 40	18 45	18 51	18 57	19 05	19 11	19 20	19 28	19 37	19 46
19	19 31	19 36	19 42	19 48	19 54	20 01	20 08	20 16	20 24	20 33	20 43	20 52
20	20 33	20 38	20 44	20 51	20 57	21 05	21 12	21 20	21 29	21 09	21 49	21 59
21	21 35	21 41	21 46	21 33	22 00	22 08	22 16	22 25	22 34	22 44	22 55	23 06
22	22 37	22 43	22 49	22 56	23 04	23 12	23 20	23 29	23 36	23 50	24 01	24 12
23	23 38	23 45	23 51	23 59	24 07	24 15	24 24	24 34	24 44	24 55	25 07	25 19
23,29	24 38	24 15	24 22	24 29	24 38	25 46	25 56	25 05	25 16	25 27	25 39	25 51

A TABLE of Amplitudes, from the Latitude 25 Deg. 00 Min. to the Latitude 36 Deg. either North or South.

Degrees of Declination.	The Degrees of Latitude.											
	25	26	27	28	29	30	31	32	33	34	35	36
	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M
0	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00
1	01 06	01 07	01 07	01 08	01 08	01 09	01 10	01 10	01 11	01 12	01 13	01 14
2	02 12	02 13	02 14	02 16	02 17	02 18	02 20	02 21	02 23	02 25	02 27	02 28
3	03 18	03 20	03 22	03 24	03 25	03 28	03 30	03 33	03 35	03 37	03 40	03 43
4	04 25	04 27	04 29	04 32	04 34	04 37	04 40	04 43	04 46	04 50	04 53	04 57
5	05 31	05 33	05 36	05 40	05 43	05 46	05 50	05 54	05 58	06 02	06 06	06 11
6	06 37	06 41	06 44	06 48	06 52	06 56	07 00	07 04	07 09	07 15	07 20	07 25
7	07 43	07 48	07 51	07 56	08 00	08 05	08 10	08 16	08 21	08 27	08 33	08 39
8	08 50	08 54	08 59	09 04	09 09	09 15	09 21	09 27	09 33	09 39	09 47	09 54
9	09 56	10 01	10 06	10 12	10 18	10 24	10 31	10 37	10 45	10 52	11 00	11 09
10	11 02	11 07	11 14	11 20	11 26	11 33	11 41	11 48	11 56	12 04	12 13	12 23
11	12 09	12 15	12 22	12 29	12 36	12 43	12 52	13 00	13 09	13 18	13 28	13 38
12	13 16	13 22	13 29	13 37	13 45	13 53	14 02	14 11	14 21	14 31	14 42	14 53
13	14 23	14 31	14 38	14 46	14 54	15 34	15 13	15 23	15 33	15 44	15 56	16 09
14	15 29	15 37	15 45	15 54	15 03	16 13	16 23	16 34	16 45	16 57	17 11	17 24
15	16 35	16 44	16 53	17 03	17 12	17 23	17 34	17 46	17 58	18 11	18 25	18 39
16	17 42	17 51	18 01	18 11	18 22	18 33	18 45	18 58	19 11	19 25	19 39	19 55
17	18 49	18 59	19 09	19 20	19 31	19 43	19 56	20 10	20 24	20 39	20 54	21 11
18	19 56	20 06	20 17	20 29	20 41	20 54	21 08	21 22	21 37	21 53	22 10	22 27
19	21 03	21 14	21 26	21 38	21 51	22 05	22 19	22 34	22 50	23 07	23 25	23 43
20	22 10	22 22	22 34	22 48	23 01	23 16	23 31	23 47	24 04	24 21	24 40	25 00
21	23 18	23 30	23 43	23 57	24 11	24 27	24 43	25 00	25 18	25 36	25 56	26 18
22	24 24	24 38	24 51	24 06	25 22	25 38	25 55	26 13	26 32	26 51	27 13	27 33
23	25 32	25 46	26 00	26 16	26 32	26 49	27 07	27 26	27 46	28 07	28 29	28 53
23,29	26 05	26 19	26 34	26 49	27 06	27 23	27 42	28 01	28 22	28 44	29 06	29 30

A TABLE of Amplitudes, from the Latitude 37 Deg. 00 Min. to the Latitude 48 Deg. either North or South.

Degrees of Declination.	The Degrees of Latitude.											
	37	38	39	40	41	42	43	44	45	46	47	48
	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M
0	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00
1	01 15	01 16	01 17	01 18	01 19	01 21	01 22	01 23	01 25	01 26	01 28	01 29
2	02 30	02 32	02 34	02 36	02 39	02 41	02 44	02 47	02 50	02 53	02 56	02 59
3	03 45	03 48	03 51	03 55	03 58	04 02	04 06	04 10	04 15	04 19	04 24	04 29
4	05 00	05 05	05 08	05 13	05 18	05 23	05 28	05 34	05 40	05 46	05 52	05 59
5	06 15	06 21	06 26	06 32	06 38	06 44	06 51	06 58	07 05	07 12	07 20	07 29
6	07 31	07 37	07 43	07 50	07 57	08 05	08 13	08 21	08 30	08 39	08 49	08 59
7	08 46	08 54	09 01	09 09	09 17	09 26	09 35	09 45	09 56	10 06	10 18	10 30
8	10 02	10 11	10 19	10 28	10 37	10 47	10 58	11 09	11 21	11 34	11 47	12 00
9	11 17	11 27	11 37	11 47	11 57	12 09	12 21	12 34	12 47	13 01	13 16	13 31
10	12 32	12 43	12 54	13 05	13 18	13 31	13 44	13 58	14 13	14 28	14 44	15 02
11	13 49	14 01	14 12	14 25	14 39	14 53	15 07	15 22	15 38	15 56	16 15	16 34
12	15 05	15 18	15 31	15 45	16 00	16 15	16 31	11 48	17 06	17 25	17 45	18 06
13	16 21	16 35	16 49	17 05	17 20	17 37	17 55	18 13	18 33	18 54	19 16	19 39
14	17 38	17 53	18 08	18 24	18 42	19 00	19 19	19 39	20 00	20 23	20 47	21 12
15	18 54	19 10	19 27	19 44	20 04	20 23	20 43	21 05	21 28	21 52	22 18	22 45
16	20 11	20 28	20 46	21 05	21 25	21 46	22 08	22 32	22 56	23 23	23 50	24 20
17	21 28	21 46	22 06	22 26	22 47	23 10	23 34	23 59	24 25	24 53	25 23	25 55
18	22 46	23 05	23 26	23 47	24 10	24 34	24 59	25 26	25 54	26 25	26 57	27 31
19	24 03	24 24	24 46	25 09	25 33	25 58	26 25	26 54	27 25	27 58	28 32	29 07
20	25 21	25 43	26 06	26 31	26 56	27 24	27 53	28 23	28 56	29 31	30 07	30 45
21	26 39	27 03	27 27	27 53	28 21	28 50	29 20	29 53	30 27	31 03	31 42	32 23
22	27 58	28 23	28 49	29 16	29 45	30 16	30 48	31 22	31 58	32 37	33 18	34 03
23	29 17	29 43	29 11	30 40	31 11	31 43	32 16	32 51	33 30	34 12	34 56	35 43
23,29	29 56	30 22	30 50	31 20	31 52	32 28	33 03	33 40	34 20	35 03	35 48	36 35

A TABLE of Amplitudes, from the Latitude 49 Deg. 10 Min. to the Latitude 60 Deg. either North or South.

Degrees of Declination.	The Degrees of Latitude.											
	49	50	51	52	53	54	55	56	57	58	59	60
	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M	D M
0	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00
1	01 31	01 33	01 35	01 07	01 39	01 42	01 45	01 47	01 50	01 53	01 56	02 00
2	03 03	03 06	03 10	03 15	03 20	03 24	03 29	03 34	03 40	03 46	03 53	04 00
3	04 34	04 40	04 46	04 52	04 59	05 06	05 14	05 22	05 31	05 40	05 50	06 00
4	06 06	06 14	06 22	06 30	06 39	06 49	06 59	07 10	07 22	07 34	07 47	08 01
5	07 38	07 48	07 58	08 08	08 19	08 31	08 44	08 57	06 11	09 26	09 43	10 02
6	09 10	09 21	09 33	09 46	10 00	10 15	10 30	10 47	11 04	11 22	11 42	12 04
7	10 42	10 55	11 09	11 24	11 40	11 57	12 15	12 35	12 56	13 18	13 41	14 06
8	12 14	12 29	12 45	13 02	13 21	13 41	14 02	14 24	14 48	15 14	15 41	16 10
9	13 47	14 05	14 24	14 43	15 04	15 26	15 49	16 14	16 45	17 10	17 41	18 14
10	15 21	15 40	16 01	16 23	16 46	17 11	17 37	18 05	18 33	19 07	19 41	20 18
11	16 54	17 16	17 39	18 03	18 29	18 57	19 26	19 56	20 29	21 04	21 43	22 26
12	18 28	18 52	19 18	19 44	20 12	20 43	21 15	21 49	22 25	23 04	23 47	24 34
13	20 03	20 29	20 57	21 26	21 57	22 30	23 05	23 43	24 23	25 07	25 54	26 44
14	21 38	22 06	22 37	23 08	23 42	24 18	24 56	25 37	26 21	27 09	28 01	28 55
15	23 14	23 45	24 18	24 52	25 28	26 07	26 49	27 34	28 22	29 14	30 12	31 09
16	24 51	25 24	25 59	26 36	27 16	27 58	28 43	29 32	30 24	31 21	32 22	33 27
17	26 28	27 03	27 41	28 21	29 04	29 50	30 39	31 31	32 27	33 28	34 32	35 47
18	28 06	28 43	29 24	30 07	30 53	31 42	32 35	33 33	34 34	35 40	36 53	38 09
19	29 45	30 45	31 08	31 55	32 45	33 38	34 35	35 36	36 46	37 54	39 13	40 36
20	31 25	32 08	32 54	33 44	34 39	35 35	36 36	37 42	38 53	40 12	41 37	43 10
21	33 06	33 52	34 41	35 34	36 31	37 32	38 39	39 51	41 09	42 34	44 05	45 48
22	34 48	35 37	36 30	37 27	38 29	39 26	40 47	42 04	43 27	44 59	46 40	48 30
23	36 33	37 26	38 23	39 24	40 29	41 40	42 56	44 19	45 50	47 30	49 21	51 24
23,29	37 26	38 30	39 19	40 23	41 20	42 46	44 00	42 27	45 02	48 46	50 47	52 51

A TABLE of Amplitudes, from the Latitude 61 deg. 00 min. to the Latitude 66 deg. either North or South.

Degrees of Declination.	The Degrees of Latitude.											
	61		62		63		64		65		66	
	D	M	D	M	D	M	D	M	D	M	D	M
0	00	00	00	00	00	00	00	00	00	00	00	00
1	02	03	02	07	02	12	02	17	02	22	02	27
2	04	08	04	15	04	24	04	33	04	44	04	55
3	06	12	06	24	06	37	06	51	07	06	07	23
4	08	17	08	32	08	50	09	09	09	30	09	52
5	10	21	10	41	11	04	11	28	11	54	12	22
6	12	27	12	52	13	19	13	47	14	19	14	53
7	14	34	15	02	15	34	16	08	16	45	17	26
8	16	40	17	14	17	51	18	30	19	13	20	00
9	18	49	19	28	20	09	20	54	21	43	22	37
10	20	57	21	40	22	27	23	18	24	13	25	14
11	23	10	23	58	24	51	25	48	26	50	27	58
12	25	23	26	17	27	15	28	19	29	28	30	44
13	27	39	28	37	29	42	30	52	32	09	33	34
14	29	56	31	01	32	12	33	30	34	55	36	29
15	32	16	33	27	34	45	36	11	37	46	39	31
16	34	39	35	57	37	23	38	57	40	42	42	40
17	37	05	38	31	40	05	41	49	43	46	45	58
18	39	36	41	10	42	54	44	49	46	59	49	26
19	42	11	43	54	45	49	47	55	50	23	53	11
20	44	52	46	46	48	53	51	17	54	02	57	14
21	47	40	49	46	52	07	54	50	57	59	61	47
22	50	35	52	56	55	36	58	43	62	26	67	04
23	53	42	56	20	59	24	63	02	67	36	73	52
23,29	55	17	58	04	61	22	65	22	70	33	78	25

The Use of the TABLES of Amplitudes.

The Amplitude of the Sun, or any Star, is so many Degrees Distance as they rise or set from the East or West Points of the Horizon, either Northerly or Southerly.

Note. When the Sun or Stars have North Declination, then the Amplitude found by these Tables must be reckoned from the East toward the North at their Rising, or from the West toward the North at their Setting.

But if they have South Declination, then the Amplitude must be reckoned from the East toward the South at their Rising, or from the West toward the South at their Setting.

To find the true Amplitude by the Tables.

Look for the given Latitude at the Top of the Table, and the Declination in the first Column to the Left-hand, and in the common Angle of Meeting you will find the Amplitude required, in Degrees and Minutes.

Case

Case 1st. WHEN the Latitude and Declination are both given in even Degrees, as for Example. Suppose I would know the Sun's true Amplitude at his Rising, in the Latitude of 40.00, his Declination being 17.00 N.

Under Latitude 40, and right against Declination 17, I find 22.26, which is the Sun's true Amplitude, to be counted from the East towards the North, because it is at his Rising, and the Declination is North) that is, E. 22 26 North.

Case 2d. When the Latitude is given in even Degrees, and the Declination in Degrees and Minutes, as for Example. Suppose I would know the Sun's true Amplitude at his Setting, in the Latitude of 57 00, his Declination being 11 33 S.

Find his Amplitude as before, for the Latitude 57, and for the Declination { 11 deg. / 12 deg. } which will be { 20 29 / 22 25 } then subtract the Lesser from the Greater, the Diff. is 1 56 or 116 Minutes, to which put two Cyphers, and it makes 11600, which Number must be divided by the Number standing against the odd Minutes of Declination (in the following Table) which in this Case is 181, and the Quotient gives the proportional Parts in Minutes, which Parts are always to be added to the Lesser of the two Amplitudes that you took the Difference of, and the Sum gives the true Amplitude as follows.

181)11600(64 Proportional Parts in Minutes.
740 makes 1 Degree 4 Minutes.
10

Lesser of the Amplitudes	20 19
Proportional Parts to be added	01 04
True Amplitude	W. 21 33 S.

because at Sun-setting, and the Declination South.

Case 3d. When the Declination is given in even Degrees, and the Latitude in Degrees and Minutes, as for Example. Suppose I would know the Sun's true Amplitude at his Rising, in the Latitude 51 14, his Declination being 14 00 S.

Find his Amplitude as before, to 14 Degrees Declination, and for the Latitude { 51 deg. / 52 deg. } which will be { 22 37 / 23 08 } and subtract the Lesser from the Greater, the Difference is 0 31 Minutes.

To

To the Difference of Amplitudes found on the foregoing Side, which is 31, put two Cyphers, and make it 3100, which muſt be divided by the Number ſtanding againſt the odd Minutes of Latitude (in the following Table) which in this *Caſe* is 428, and the Quotient gives the proportional Parts in Minutes, to be added to the Leſſer of the two Amplitudes, as in *Caſe* the 2d.

428)3100(7 proportional Parts in Minutes.
104

Leſſer of the Amplitudes	22 37	
Proportional Parts to be added	00 07	
True Amplitude	E. 22 44	S.

Caſe 4th. When the Latitude and Declination are both given in Degrees and Minutes, as for Example: Suppoſe I would know the Sun's true Amplitude at his Setting, in the Latitude 49 18, his Declination being 19 41 N.

Firſt, find his Amplitude for Latitude 49 Degrees, and Declination 19 41 (as in *Caſe* the 2d) which will be 30 53.

In the ſame Manner find his Amplitude for Latitude 50 Degrees, and Declination 19 41, which will be 31 35.

Then from the Greater Amplitude	31 35	
Subtract the Leſſer	30 53	
Remains the Difference	00 42	Minutes.

Put two Cyphers to this Difference, it makes 4200, which muſt be divided by the Numbers ſtanding right againſt the odd Minutes of the given Latitude (in the following Table) which in this *Caſe* is 333, the Quotient gives the proportional Parts in Minutes, to be added to the Leſſer of the two Amplitudes, *&c.*

333)4200(12 proportional Parts.
870

204

The leſſer Amplitude	30 53	
Proportional Parts to be added	00 12	
True Amp. for Lat. 49 18, and Decl. 19 41 N.	W. 31 05	N.

A TABLE of Numbers for finding the proportional Parts to the odd Minutes of Latitude or Declination, in finding the Sun's true Amplitude.

Odd Minutes.	Numbers.	Odd Minutes.	Numbers.	Odd Minutes.	Numbers.	Odd Minutes.	Numbers.
1	6000	16	375	31	193	46	130
2	3000	17	353	32	187	47	127
3	2000	18	333	33	181	48	125
4	1500	19	316	34	176	49	122
5	1200	20	300	35	171	50	120
6	1000	21	285	36	166	51	118
7	857	22	273	37	162	52	115
8	750	23	261	38	158	53	113
9	666	24	250	39	154	54	111
10	600	25	240	40	150	55	109
11	545	26	230	41	146	56	107
12	500	27	222	42	143	57	105
13	461	28	214	43	139	58	103
14	428	29	207	44	136	59	101
15	400	30	200	45	133		

The Uſe of this Table is to find a Number to divide the Difference of Amplitudes by, in order to find the proportional Parts, when the Amplitude is required for any Latitude or Declination that is given in Degrees and Minutes, (as in the foregoing Caſes) to find which Number, look in ſome of the Columns under the Title of odd Minutes for your given Minutes of Latitude or Declination; as ſuppoſe for 37 Minutes, and right againſt that you will find 162, which is the Number required.

To

To find the Variation of the Compaſs by an Amplitude.

To do this, you muſt have given both the true and magnetical Amplitudes.

The true Amplitude is to be found by the Tables as before taught.

The magnetical Amplitude is to be found by the Compaſs, at the Time of the Sun's Riſing or Setting, and is ſo many Degrees or Minutes as you ſee it riſe from the Eaſt, or to ſet from the Weſt, either to the Northward or to the Southward: As for Example, Suppoſe, being at Sea, I find, by ſetting the Sun with my Compaſs, that he riſes 10 Deg. 15 Min. to the Northward of the Eaſt, then the magnetical Amplitude is E. 10 15 N. or ſuppoſe I find by the Compaſs, that he ſets 14 Deg. 12 Min. to the Southward of the Weſt, then the magnetical Amplitude is W. 14 12 S.

Then if your true Amplitude and magnetical Amplitude are both to the Northward, or both to the Southward, ſubtract the Leſſer from the Greater, the Remainder is the Variation.

But if one be to the Northward, and the other to the Southward, add them together, and the Sum will be the Variation.

		D. M.
Example 1ſt.	True Amplitude	E. 18 34 N.
	Magnetical Amplitude	E. 22 37 N.
	Variation	04 03 Eaſt
Example 2d.	True Amplitude	W. 7 11 S.
	Magnetical Amplitude	W. 2 06 N.
	Variation	9 17 Weſterly

And thus having found how much the Variation is, it remains in the next Place to find which Way it is, that is, whether it be Eaſterly or Weſterly.

Rule. If the Amplitude be taken at Sun-riſing, and the magnetical Amplitude be farther from the North than the true Amplitude is, then the Variation is Weſterly; but if it be nearer to the North, it is Eaſterly.

If it be taken at Sun-ſetting, if the magnetical Amplitude be farther from the North than the true Amplitude is, then the Variation is Eaſterly, but if nearer to the North, it is Weſterly, as may be ſeen by the two foregoing Examples.

By

By keeping a Journal, is meant, keeping ſuch an Account of the Ship's Way, that at any Time you may be able to know what Latitude and Longitude the Ship is in.

When a Ship is bound from any one Place to another, that lies ſo far from it that ſhe is obliged to go out of Sight of the Land for any conſiderable Time, as ſuppoſe from *England* to *Barbadoes*, then at the Time ſhe leaves the Land, ſhe is ſaid to take her Departure, and that Part of the Land ſhe then leaves, as ſuppoſe the *Start*, the *Lizard*, the *Land's End*, &c. is ſaid to be the Place they take their Departure from; and at the Time of taking ſuch Departure, the Captain or Mate generally takes the Bearing and Diſtance of that Land, according to his Judgment, and ſets it down on the Log-board, or in the Log-book, againſt the Time it was taken, thus,

Lizard, N. by W. Diſtance 5 Leagues.
Or, *Start*, N.N.E. Diſtance 6 Leagues, *&c.*

And in the ſame Manner for any other Place, Bearing, and Diſtance, as you will ſee in the firſt Day's Log, in the following Journal.

The Log-book being marked as follows, with Columns for Courſe, Diſtance, Northing or Southing, Eaſting or Weſting, Latitude by Dead-Reckoning, Latitude by Obſervation, Meridian Diſtance, Longitude made, and Longitude in, you are to take Notice,

That in the Column for Courſe, you are always to ſet down the Courſe you have made by your Reckoning for that 24 Hours (that is from the Noon of the Day before, to the Noon of the Day you work on) the Sea Account being always kept from Noon to Noon.

In the Column for Diſtance, you are to ſet down the Diſtance made by your Reckoning for that 24 Hours.

In the Column of Northing or Southing, you are to ſet down the Difference of Latitude made that 24 Hours, marking the Column with N. if the Difference of Latitude be Northerly, or with S. if it be Southerly.

In the Column of Eaſting or Weſting, you are to ſet down the Departure made that 24 Hours, marking the Column with E. if the Departure be Eaſterly, or with W. if it be Weſterly.

In the Column marked Lat. by D. R. you are to ſet down the Latitude you reckon yourſelf in on that Day.

In

In the Column marked Lat. by Obſ. you are to ſet down the Latitude you find yourſelf to be in by Obſervation, if you have one, if not, then let it ſtand open.

In the Column for Mer. Diſt. you are to ſet down (in Degrees and Minutes) how much Departure you have made in all, from the Place you took your Departure from.

In the Column of Long. made, you are to ſet down (in Degrees and Minutes) how much Difference of Longitude you have made in all from the Place you took your Departure from.

In the Column of Long. in, you are to ſet down what Longitude you find yourſelf to be in on that Day by your Reckoning.

Note, The Account of Longitude made, being what is always kept in his Majeſty's Navy; and the Account of Longitude in, being moſt generally kept on Board the Merchant-Ships: I ſhall in this Treatiſe ſhew how to keep them both, and ſhall leave it to the Prctitioner's Choice which he will make Uſe of, they both being equally true, and there being no Occaſion to keep more than one of them.

And now having (I think) given a ſufficient Account of Things that are to be ſet down in the different Columns, I ſhall lay down theſe few neceſſary Rules following, and then proceed to ſhew how they are all to be found, or the Method of working a Day's Work at Sea.

Rule 1ſt. Variation, if there be any (as moſt commonly there is) muſt be allowed upon all Courſes ſteered, and upon all Bearings, *&c.* that are taken by the Compaſs; that is, if it be Eaſterly Variation, it muſt be allowed to the Right-hand; but if Weſterly Variation, then to the Left-hand of the Courſe or Bearing: Suppoſing yourſelf placed in the Center of the Compaſs, and looking directly forward to the Point you are to allow the Variation from.

Example. Suppoſe I ſteer S.W. and there is one Point Weſterly Variation, then my true Courſe will be S.W. by S. or ſuppoſe I ſet a Point of Land, and find it to bear by my Compaſs E. S. E. and I know there is half a Point Eaſterly Variation, then the true Bearing is S. E. by E. ½ E.

Rule 2d. Lee-way (which I ſhall not here deſcribe, becauſe ſufficiently known to every Seaman) muſt be allowed to the Right-hand of the Courſe ſteered, when the Larboard Tacks are a-board, and to the Left-hand when the Starboard Tacks are a-board.

Ex-

Example. Suppoſe I ſteer N. E. by E. with my Larboard Tacks aboard, and make one Point Lee-way, then my Courſe made good is E. N. E.

Rule 3d. Lee-Way and Variation, when they are both to be allowed one Way, that is, both to the Right-hand, or both to the Left, add them together, and allow their Sum the ſame Way they were to be allowed.

But if they are to be allowed, one to the Right-hand, and the other to the Left, ſubtract the Leſſer from the Greater, and allow the Remainder the ſame Way as the Greater of them was to be allowed.

Example. Suppoſe I ſteer N. N. W. with my Starboard Tacks aboard, and make one Point Lee-way, there being at the ſame Time half a Point Weſterly Variation, I would know my true Courſe?

Lee-way to the Left-hand ——— 1 0 Point
Variation to the Left-hand ——— 0 ½ Point

Their Sum to be allowed to the Left-hand 1 ½ Point makes the true Courſe N. W. by N. ½ W.

Example 2d. Suppoſe I ſteer S. W. by W. with my Larboard Tacks aboard, and make 2½ Points Lee-way, and I have 1¼ Points Weſterly Variation, what is my true Courſe?

Lee-way to the Right-hand——— 2 ¼ Points.
Variation to the Left-hand ——— 1 ¼

The Remainder to be allowed to the Right-hand 1 ¼ Points, makes the true Courſe W. S. W. ¼ W.

Rule 4th. When a Ship is lying too under a Main-ſail, Mizen, *&c.* then obſerve how ſhe comes up and falls off, and take the Middle between the two Points, and from that allow the Lee-way and Variation as in Rule 3d.

Example. Suppoſe a Ship lying too under a Main-ſail, with the Starboard Tacks aboard, comes up E. by S. and falls off to N. E. by E. there being one Point Weſterly Variation, and ſhe makes five Points Lee-way, what Courſe does ſhe make good?

The Middle between E. by S. and N. E. by E. is E. by N. from which, allowing ſix Points to the Left-hand, (by Rule 3d.) the true Courſe will be N. by E.

Rule 5th. Currents, the Way they ſet you, and the Diſtance you ſuppoſe you are driven by them, is to be ſet down in the Traverſe-Table for the Day, as any other Courſe or Diſtance.

Ex-

Example. Suppoſe I try the Current and find it to ſet W. by N. *per* Compaſs 1 Mile *per* Hour, the Variation being one Point Eaſterly, then if I ſail in that Current 24 Hours, I ſet down in the Traverſe Table, as a Courſe, WNW. diſtant 24 Miles.

Rule 6th, Heave of the Sea is to be accounted for in the ſame Manner as Currents: As ſuppoſe there is a great Sea heaving toward the SW. by my Compaſs, there being $\frac{1}{2}$ Point Weſterly Variation, I then ſet down in my Traverſe-Table SW. by S. $\frac{1}{2}$ W. with ſo much Diſtance as I judge the Sea has heaved the Ship.

Rule 7th, At leaving the Land, the oppoſite Point to the Bearing (with the Variation allowed upon it) and the Diſtance you judge yourſelf from it, muſt be ſet down in the Traverſe-Table, as a Courſe and Diſtance.

Example, Suppoſe having one $\frac{1}{4}$ Weſterly Variation, the *Start* bears by my Compaſs N.N.E. diſtant 4 Leagues. The oppoſite Point to N N.E. is S.S.W. which with the Variation makes S. $\frac{3}{4}$ W. for the Courſe to be ſet in the Traverſe-Table, diſtant 12 Miles.

Rule 8th, When you make the Land, the Bearing itſelf (with the Variation allowed upon it) and the Diſtance you judge yourſelf from it are to be ſet in the Traverſe-Table, as a Courſe and Diſtance: This needs no Example.

Note, If you keep only the Account of Longitude made, and would at any Time know what Longitude you are in, look out the Longitude of the Place you took your Departure from, and with that Longitude, and the Longitude made, taken as Difference of Longitude, find the Longitude come into, by the Rules in Page 107 and 108. And the Longitude ſo found muſt be counted from the ſame Meridian that the Tables you look'd out the Longitude of the Place departed from, counts it.

RULES to correct the Dead-Reckoning *by an* Observation.

WHEN you have made all the proper Allowances you can, such as for Variation, Lee-way, Currents, *&c.* and ſtill find that your Latitude by Dead-Reckoning will not agree with the Latitude by Obſervation, within five Minutes, then you muſt correct as follows.

CASE the Firſt.

If your Courſe found by Dead-Reckoning be due North, or due South.

Rule. Firſt find the Difference nf Latitude (in Miles) between the laſt Obſervation, and the Obſervation on the Day you correct, which will be the true Difference of Latitude, then will your true Courſe be the ſame as the Courſe by Dead-Reckoning. Your true Diſtance the ſame as the true Difference of Latitude. Your Departure oo, and your Meridian Diſtance, Longitude made, (or Longitude in) will be the ſame as they were on the Day you had the laſt Obſervation.

CASE the Second.

If the Courſe found by Dead-Reckoning be leſs than three Points, or thirty-three Degrees.

Rule, Firſt find the Difference of Latitude (in Miles) between the laſt Obſervation, and the Obſervation on the Day you correct, which will be the true Difference of Latitude. Then make your true Courſe the ſame as the Courſe found by Dead-Reckoning, ſince the laſt Obſervation, and with that Courſe, and the true Difference of Latitude, find the true Diſtance and Departure, *(as in Plane Sailing, Caſe the 2d.)* then to find the Meridian Diſtance, the Longitude made, and the Longitude in, take the following Rule.

N.B. The Difference of Longitude is to be found by the true Courſe, and the Meridional Difference of Latitude between the two Obſervations (as uſual) and the Meridian Diſtance, Longitude made (or Longitude in) are to be found by adding, or ſubtracting the true Departure and Difference of Longitude to, or from the Meridian Diſtance, Longitude made (or Longitude in) on the Day you had the laſt Obſervation, which is the Day you always correct from.

CASE

CASE the Third.

If the Courſe found by Dead-Reckoning be more than three Points, or thirty-three Degrees, and leſs than 6 Points, or ſixty-ſeven Degrees.

Rule, Firſt find the Difference of Latitude in Miles between the laſt Obſervation, and the Obſervation on the Day you correct, which will be the true Difference of Latitude: Then with the Courſe found by Dead-Reckoning, ſince the laſt Obſervation, and the true Difference of Latitude, find a new Departure, *(by the Second Caſe of Plane Sailing)* add this new Departure to the Departure found by Dead-Reckoning ſince the laſt Obſervation, and take half their Sum for your true Departure: Then you have given the true Difference of Latitude and Departure to find your true Courſe and Diſtance, *(by Plane Sailing, Caſe 6th)* read here *N.B.* in Caſe the 2d.

CASE the Fourth.

If the Courſe found by Dead-Reckoning be more than ſix Points, or ſixty-ſeven Degrees.

Rule, Firſt find the Difference of Latitude in Miles between the laſt Obſervation, and the Obſervation on the Day you correct, which will be the true Difference of Latitude, and make your true Departure the ſame as the Departure found by Dead-Reckoning ſince the laſt Obſervation: Then you have given the true Difference of Latitude and Departure, to find the true Courſe and Diſtance *(by Plane Sailing, Caſe 2d)* read here the *N.B.* in Caſe the 2*d*.

Note, As the Knowledge of which Caſe you are to correct by depends upon knowing your Courſe by Dead-Reckoning, and as when you correct only for one Day, that Courſe is always found by the Difference of Latitude and Departure in your Traverſe-Table for that Day; therefore if you are to correct for a longer Time than one Day, you muſt take the Northing, Southing, Eaſting, and Weſting, that you have made for every Day ſince the laſt Obſervation, (or if it be your firſt Obſervation, then for every Day from your leaving the Land) minding not to leave out the Difference of Latitude and Departure for the Day you are correcting on, and bring them into a Traverſe-Table; by which you will find the whole Difference of Latitude and Departure, made by Dead-Reckoning ſince the laſt Obſervation, and with that ſame Difference of Latitude and Departure find

find the Courſe made by Dead-Reckoning, then obſerve which of the foregoing Caſes that Courſe comes under, and correct by the Rules for that Caſe, finding every Thing except the Diſtance.

And when you have ſo corrected, you are to ſet down in your Book only the Latitude by Dead-Reckoning, the Latitude by Obſervation, the Meridian Diſtance, and the Longitude made (or Longitude in) and rub out the Courſe, Difference of Latitude and Departure.

Then you have given the Latitude by Obſervation on the Day you correct, and the Latitude by Dead-Reckoning on the Day before it, to find the Difference of Latitude for the laſt 24 Hours (by the Rules for Latitude, Page 105.) Alſo the Meridian Diſtance on the Day you correct, and the Meridian Diſtance on the Day before it, to find your Departure, (by ſubtracting the Leſſer from the Greater, if they are both Eaſt, or both Weſt; or by adding them together, if one be Eaſt and the other Weſt.) And with that Difference of Latitude and Departure find your Courſe and Diſtance *(by the 6th Caſe of Plane Sailing)* which Courſe, Diſtance, Difference of Latitude and Departure are to be ſet down inſtead of thoſe you rubbed out.

Rules to find the Meridian Diſtance.

Caſe 1ſt, If the Meridian Diſtance on the Day you work from the Eaſt, and you have ſail'd to the Eaſtward; or if it be Weſt, and you have ſail'd to the Weſtward, then add the Departure to the Meridian Diſtance, and the Sum will be the Meridian Diſtance you have made, of the ſame Name with that you work'd from.

Example. Meridian Diſtance ——— 4 18 W.
Departure Weſterly 97 Miles, or——— 1 37
Meridian Diſtance made in all ——— 5 55 W.

Caſe 2d, If your Meridian Diſtance be Eaſt, and the Departure be Weſterly; or if the Meridian Diſtance be Weſt, and Departure Eaſterly, then ſubtract the Leſs from the Greater, the Remainder will be the Meridian Diſtance you have made, of the ſame Name with the Greater of the two.

Example 1ſt. Meridian Diſtance——— 7 34 W.
Departure Eaſterly——— 1 16 W.
Example 2d. Meridian Diſtance made in all — 6 18 W.
Meridian Diſtance——— 1 34 W.
Departure Eaſterly——— 3 17
Meridian Diſtance made in all — 1 43 E.

A

JOURNAL

OF

A VOYAGE from ENGLAND

TOWARDS

MADEIRA.

H	K.	H K	F.	Courſes	Winds	Lee-way	Tranſactions, Thurſday, May the 13th, 1775
2							
4							
6	The	*Start*	N.	by E. D	iſt 6 Le	ag.	Moderate Gales and fair Weather, at 6 (p. m.) the *Start* bore as per Long. from which I take my Departure, it being in the Latitude 50 07 N. and Long. of 3.47 W. from *London*.
8	4			S W b W	N. E.		
10	4	1					
12	5						
2	5						
4	5	1		S W			
6	5	1					
8	5	1					
10	5	1					
12	6						Variation 1 ¼ Point Weſterly.

Courſe	Diſt	S.	W	Lat by D R	Lat. by Ob	Mer. Diſt	Lon. made	Lon. in
S 30 00 W	108	93	53	48 34 N		00 53 W.	01 22 W	05 09 W

The Manner of working this Day's Work.

The oppoſite Point to the Bearing of the Land is S. by W. which with the Variation allow'd upon it (as before taught) makes S. ¼ E. and the Diſtance from the Land 6 Leagues, or 18 Miles, which are to be ſet down for the firſt Courſe and Diſtance in the following Traverſe-Table.

Then the firſt Courſe ſteer'd being S.W. by W. the Variation allow'd upon it will make it SW. by S. ¾ W. and the Sum of all the Diſtances from 8 o'Clock where that Courſe begins, to 2 o'Clock where it ends, being 18 Miles and a Half, I double that Sum, becauſe the Book is marked only for every two Hours) and it makes 37 Miles for the Diſtance belonging to that Courſe. But if the Book had been marked for every Hour, as it is in the *Navy*, and aboard the *Eaſt-India Ships*, then I muſt have taken the Sum without doubling it for the Diſtance, and in the ſame Manner I reckon the other Courſe and Diſtance; all which will be as in the following Traverſe-Table.

And then every thing being found as on the other Side, I ſet them down in their proper Columns as above.

Courſe

Courſes.	Diſt.	N.	S	E.	W.
S. ¼ W.	18		18.0	0.9	
SW by S ¾ W	37		27.4		24.8
SSW. ¾ W.	56		48.0		28.8
Difference of Latitude South			93.4	0.9	53.6
					0.9
					52.7 Dep. W.

The ſeveral Courſes and Diſtances in this Table being look'd out and caſt up as in the Rules for Traverſe Sailing, (Page 52.) I find my Difference of Latitude to be 93 Miles and 4 Tenths, and my Departure 52 Miles and 7 Tenths: Then I mark down (upon my Slate, or the Paper that I work upon) every Thing that is to be found, and as I find what they come to, I ſet againſt them as follows:

By D. R.	Courſe	S.	30	00	W.
	Diſtance		108		Miles
	Diff. of Lat.		93		S.
	Departure		53		W.
	Latitude by D.R.	48	34		N.
	Lat. Obſervation				
	Meridian Diſtance	00	53		W.
	Longitude made	01	22		W.
	Longitude in	05	09		W.

Becauſe the Diff. Lat. is S. and the Dep. W.

Note, When the Tenths in any Side are more than 5, or half a Mile, you muſt call that Side 1 Mile more than you found it to be; but when they are leſs than 5, then you need take no Notice of them. As in this Caſe the Diff. of Lat. being 93.4 I reject the 4 Tenths, and call it only 93 Miles, and the Dep. being 52.7 inſtead of the 7 Tenths I put 1 Mile to it, and call it 53 Miles

But when you take the Difference of Latitude and Departure to find the Courſe by, then take them in Miles and Tenths.

Then in the firſt Place, with my Difference of Latitude 93.4, and my Departure 52.7, (as taught in Plane Sailing, Caſe the 6th) I find my Courſe to be 30 Degrees, and my Diſtance 108 Miles, which I ſet down againſt Courſe and Diſtance as above.

Second, For the Latitude by D R.

Take the Latitude ſail'd from	—	50	07N.
And the Diff. Lat. 93 Miles, or	—	1	33
Sub. (as per Rule) gives Lat. D.R.		48	34N.

Third, For the Meridian Diſtance.

Note, the Meridian Diſtance on the firſt Day's Work, is always the ſame as that Day's Dep. which here is 0.53 W.

Fourth, For the Difference of Longitude.

The Meridional Parts of the Latitude ſail'd from	3485
Of the Lat. by D.R.	3343
Meridional Difference of Latitude	142

Then I look for my Courſe 30 Degrees, in the Tables of Diff. of Lat. and Dep. and for the Meridian Diff. of Lat. 142, in ſome of the Diff. of Lat. Columns belonging to that Courſe, the Dep. 82 which anſwers to that Diff. Lat. is my Diff. Long.

Fifth, For the Longitude made.

The Longitude made on the firſt Day's Work, is always the ſame as that Day's Diff. of Long. which here is — 1 22 W.

Sixth, For the Longitude in.

Take the Longitude ſail'd from	3°	47	'W.
And the Diff. Long. 82 Miles or	1	22	W.
Sub. (as per Rules) gives Long. in	5	09	W.

H	K.	H K	F.	Courſes	Winds	Lee-way	Tranſactions, Friday, May the 14th, 1775.
2	6			SW b W	N.		
4	5	1					Moderate Gales and fair Weather, at 8 (a. m) ſaw a Ship to the Northward.
6	5				N W.		
8	5						
10	4	1		S W			
12	4	1					
2	4	1					
4	4	1					
6	4	1					
8	5			SW by S	W N W		
10	4	1					Variation ¼ Point Weſterly.
12	4						

Courſe	Diſt.	S	W	Lat by DR	Lat. by Ob	Mer. Diſt.	Lon. made	Lon. in
S 33 00 W	114	96	61	46 58 N.		1 54 W	2 55 W	6 42 W

The Variation being allow'd, and the Diſtances ſum'd up as before, the Traverſe-Table will be as follows.

Courſe	Diſt.	N.	S.	E.	W.
SW by S ¾ W	43		31.9		28.9
SSW ¾ W	45		38.6		23.1
S by W ¼ W	27		25.4		9.1
		Diff. of Lat. 95.9		Dep.	61.1

First, With my Difference of Latitude 95.9 and Departure 61.1 (by Plain Sailing Caſe 6,) I find my Courſe to be 33 Deg. and my Diſtance 114 Miles.

Second, For my Latitude by D.R.

Take the Latitude in Yeſterday	48 34	N.
And my Diff. of Lat. 96 Miles, or	1 36	S.

Third, For the Meridian Diſtance.

Take the Mer. Diſt. yeſterday	0 53	W.
And the Departure to day	1 01	W.
Gives the Meridian Diſtance	1 54	W.

By
- Courſe — 33 00 W.
- Diſtance — 114 Miles
- Diff. of Lat. — 96 S.
- Departure — 61 W.
- Latitude by D. R. 46 58 N.

D.R.
- Lat. by Obſervation
- Meridian Diſtance 1 54 W.
- Longitude made — 2 55 W.
- Longitude in — 6 42 W.

Fourth, For the Diff. of Longitude.

Take the Mer. Parts of yeſt. Lat.	33 43	
And of the Latitude to-day	32 00	
Gives the Mer. Diff. of Latitude	143	

with which and the Courſe (as in the firſt Day's Work) I find my Diff. of Longitude to be 93 Miles Weſt.

Fifth, For the Longitude made.

Take the Long. made yeſterday	1 22	W.
And the Diff. of Long. to-day 93 Miles, or	1 35	W.
Gives the Longitude made to-day	2 55	W.

Sixth, For the Longitude in.

Take the Long. in yeſterday	5 09	W
And the Diff. of Long. to-day	1 33	W
Gives the Longitude in	6 42	W.

H	K.	HK	F.	Courſes	Winds	Lee-way	Tranſactions, Saturday, May the 8th, 1775
2	4			S W	WNW		Moderate Gales and Cloudy.
4	4						
6	4						
8	4	1		SWbyS	W by N	½	
10	4	1					
12	4	1					
2	4	1		In 1ſt Reef both Topſails			
4	4			S S W	W	1	
6	4						
8	4						Variation 1 Point Weſterly.
10	4						
12	4						

Courſe	Diſt.	S.	W	LatbyDR	Lat. byOb	Mer. Diſt.	Lon.made	Lon. in
S 14 00W	97	95	24	45 23N.		2 18 W.	3 29 W	7 16W

The Leeway and Variation being allowed, as before taught, the Traverſe Table will be as follows.

Courſes	Diſt.	N.	S.	E.	W.
SW by S	24		20.0		13.3
S by W ½ W	36		34.5		10.4
South	40		40.0		
			94.5		23.7

By D.R.

Courſe —	S. 14 00 W.	
Diſtance —	97	Miles
Diff. of Lat. —	95	S.
Departure —	24	W.
Latitude by D. R.	45 23	N.
Lat. by Obſervation		
Meridian Diſtance	2 18	W.
Longitude made —	3 29	W.
Longitude in —	7 16	W.

Firſt, The Courſe and Diſtance found (by Plane Sailing Caſe 6.) as before will be as in the other Column.

Second, For my Latitude by D.R.

Take the Latitude in yeſterday	46	58 N.
And the Diff. of Latitude 95 Miles	1	35
Gives the Latitude by D.R. —	45	23

Third, For the Meridian Diſtance.

Take the Mer. Diſt. yeſterday	1	54W.
And the Departure to day —	0	24W.
Gives the Meridian Diſtance —	2	18W.

Fourth, For the Diff. of Longitude.

The Mer. Parts of yeſterday's Lat. —	3200
Of to-day's Latitude —	3063
The Mer. Diff. of Latitude —	137

with which, and the Courſe (as before) I find the Diff. of Long. to be 34 Miles Weſt.

Fifth, For the Longitude made.

Take the Long. made yeſterday—	2	55W.
And the Diff. of Long. to-day —	0	34W.
Gives the Long. made —	32	9W.

Sixth, For the Longitude in.

Take the Long. in yeſterday —	6	42W.
And the Diff. of Long. —	0	34W.
Gives the Longitude —	7	16W.

H	K.	H K	F.	Courſes	Winds	Lee-way
2	4			S.	W S W	1
4	4					
6	4	1				
8	4			In 2d Reef both Topſails		
10	4			S S E	S W	1½
12	4					
2	4					
4	4					
6	4			Handed the Fore Topſail		
8	4			S by E	S W b W	2
10	4					
12	3	1			Tack'd	

Tranſactions, Sunday, May the 29th, 1775.

Moderate Gales and Hazy the firſt Part, the latter freſh Gales and Rain.

Va

Variation 1 Point Weſterly.

Courſe	Diſt.	S	E.	Lat by DR	Lat. by Ob	Mer. Diſt.	Lon. made	Lon. in
S. 39 00 E.	93	72	60	44 11 N.		1 18 W	2 07 W	5 54 W

The Ship having her Starboard Tacks aboard, when the Lee-way and Variation are allowed (as before taught) the Traverſe Table will ſtand as follows:

Courſes	Diſt.	N.	S.	E.	W.
S S E	33		30.5	12.6	
S E ½ E	40		25.4	30.9	
S E	23		16.3	16.3	
			72.2	59.8	

By D.R.

Courſe —— S. 39 00 E.
Diſtance —— 93 Miles
Diff. of Lat. —— 72 S.
Departure —— 60 E.
Latitude by D.R. —44 11 N.
Latitude by Obſer.
Meridian Diſtance — 1 18 W.
Longitude made —— 2 7 W.
Longitude in —— 5 54 W.

Having been very particular in explaining the Manner of working a Day's Work (in the three foregoing Days) and as all Day's Works, where there is no Correction wanting, are to be work'd from the Difference of the Latitude and Departure found by the Traverſe-Table (as before) I have here only ſet down the Traverſe-Table, and what all the other Things come to, and have left the finding them to exerciſe the Learner.

H	K.	H K	F.	Courſes	Winds	Lee-way	Tranſactions, Monday, May the 10th, 1775.
2	4			NW b W	SW b W	2	Freſh Gales and Rain all theſe 24 Hours.
4	3						
6	3						
8	3			Hand	Main Topſail		
10	3						
12	3	1		N W	W S W	3	
2	3	1					
4	3	1					
6	3						
8	3						
10	3			NW by N	W by S	3½	Variation 1 Point Weſterly.
12	3						

Courſe	Diſt.	S.	W	Lat by DR	Lat. by Ob	Mer. Diſt	Lon. made	Lon. in
S 29 00 W	75	65	36	45 16 N.		1 54 W.	3 00 W	6 47 W

The Ship having her Larboard Tacks Aboard, when the Leeway and Variation allow'd, the Traverſe Table will ſtand as follows.

Courſes	Diſt.	N.	S.	E.	W.
N W	32	22.6			22.6
N N W	33	30.5			12.6
N ½ W	12	11.9			1.2
		65.0			36.4

By D.R.

Courſe	N	29	00 W.
Diſtance		75	Miles
Diff. of Lat.		65	N
Departure		36	W.
Latitude by D. R.	45	16	N.
Lat. by Obſervation			
Meridian Diſtance	1	54	W.
Longitude made	3	00	W.
Longitude in	6	47	W.

To find the Courſe.

Note, In this Caſe the Difference of Latitude being juſt 65 Miles without any Tenths, after you have put two Cyphers to the Departure, you muſt not divide it by 65, but by 650, the Figures being put to ſupply the Place of Tenths, as directed in the Rule for Plane Sailing.

Diff. Lat. 650) D. with Cyphers 3640 3900 (56 the

1 natural Tangent of the Courſe anſwering to 29d 15m. or (neglecting the 29d. N. Weſterly)

H	K.	H K	F.	Courſes	Winds	Lee-way	Tranſactions, Tueſday, May the 11th, 1775.
2	3			WNW	S W	3½	
4	3						Hard Gales and Squaly with Rain.
6	3			Handed the Foreſail			
8	Lay too, up NW. off N.					5	
10							
12	Drift 1½ Miles *per* Hour						
2							
4				Up N by W off NE by N			
6							
8							
10				Up NNW. off NNE.			Variation 1 Point Weſterly.
12				Set the Foreſail			

Courſe	Diſt.	N.	E.	Lat by DR	Lat. by Ob	Mer. Diſt.	Lon. made	Lon. in
S 8 00 W	35	34	5	45 50 N.		1 49 N.	2 53 W.	6 40 W

Having allowed the Leeway, and the Variation upon the firſt Courſe, and alſo from the Middle between what ſhe comes up and falls off, (as taught in the Rules for laying too,) the Traverſe-Table will ſtand as follows.

Courſes	Diſt.	N.	S.	E.	W.
NW b W ½ W	18	13.9			11.4
N N E.	12	11.1		4.6	
NE by E.	9	5.0		7.5	
N E.	6	4.2		4.2	
		34.2		16.3	11.4
				11.4	

Departure 4.9 E.

By D.R.

Courſe —— N. 8 00W.
Diſtance —— 35 Miles
Diff. of Lat. —— 34N.
Departure —— 5 E.
Latitude by D.R. 45 50 N.
Lat. by Obſervation
Meridian Diſtance 1 49W
Longitude made — 2 53W
Longitude in —— 6 40W

H	K.	H K	F.	Courſes	Winds	Lee-way
2	3			N W	W S W	4
4	3					
6	3			W N W	S W	4
				Set Main Topſail		
8	3					
10	3	1		N W	W S W	3
12	3	1				
				Set Fore Topſail		
2	3	1				
4	4			W by S	S by W	2
6	4					
				Out 2d Reef both Topſails		
8	4					
10	4			W	S S W	1½
12	4	1				

Tranſactions, Wedneſday, May the 12th, 1775.

Freſh Gales the firſt Part, the latter moderate, with ſmall Showers.

Variation 1 Point Weſterly.

Courſe	Diſt.	S.	W	Lat by DR	Lat. by Ob	Mer. Diſt	Lon. made	Lon. in
S 54 00 W	72	42	58	46 32 N.		2 47 W.	4 17 W.	8 04 W

Courſes	Diſt.	N.	S.	E.	W.
N by W	12	11.8			2.3
N W by N	12	10.0			6.7
N N W	21	19.4			8.0
W	32				32.0
W b N ½ W	9	0.9			9.0
		42.1			58.0

By D. R.

Courſe	N.	54 00 W.
Diſtance		72 Miles
Diff. of Lat.		42 N.
Departure		58 W.
Latitude by D.R.	46	32 N.
Lat. Obſervation		
Meridian Diſtance	2	47 W.
Longitude made	4	17 W.
Longitude in	8	04 W.

H	K.	H K	F.	Courſes	Winds	Lee-way	Tranſactions, Thurſday, May the 13th, 1776.
2	4	1		W by N	S W by S	1	
4	4	1					Moderate Gales and thick Hazy Weather.
6	4			Out 1ſt Reef both Topſails			
8	4	1		W	S S W.	½	
10	4	1					
12	4	1					
2	4			W by S	S by W	½	
4	4						
6	4						
8	4						
10	3	1		W S W	S	½	Variation 1 Point Weſterly.
12	3						

Courſe	Diſt.	S.	W	Lat by DR	Lat. by Ob	Mer. Diſt	Lon. made	Lon. in
S 82 00 W	95	13	95	46 19 N.		4 22 W	6 33 W.	10 20 W

Courſes	Diſt.	N.	S	E.	W.
W by N.	26	5.1			25.5
W b S ½ W	27		2.6		26.9
W S W ½ W	32		9.3		30.6
S W b W ½ W	13		6.1		11.5
		5.1	18.0		94.5
			5.1		
Diff. of Latitude			12.9		

By D. R.

Courſe	S. 82 00 W.	
Diſtance	95	Miles
Diff. of Lat.	13	S.
Departure	95	W.
Latitude by D.R.	46 19	N.
Lat. Obſervation		
Meridian Diſtance	4 22	W.
Longitude made	6 33	W.
Longitude in	10 20	W.

H	K.	H K	F	Courſes	Winds	Lee-way	Tranſactions, Friday, May the 24th, 1775.
2	2	1		W S W	S		Little Wind and ſmall Showers of Rain.
4	2	1					
6	2	1					
8	2						A great Swell from the SW. for which I allow 6 Miles.
10	2						
12	2						
2	1	1		SW b W	S by E.		
4	1	1					
6	1	1					
8	1						Variation $\frac{3}{4}$ Point Weſterly.
10		1					
12		1					

Courſe	Diſt.	S.	W	Lat by DR	Lat. by Ob	Mer. Diſt.	Lon made	Lon. in
S 57 00	34	19	29	46 00 N.		4 51 W.	7 15 W.	11 2 W

Courſes	Diſt.	N.	S.	E.	W.
SW by W	30		16.7		24.9
S W	10		7.1		7.1
N E by N	6	5.0		3.3	
		5.0	23.8	3.3	32.0
			5.9		3.3
			18.8		28.7

Corrected

Courſe —— S. 57 00 W.
Diſtance —— 34 Miles
Diſ. of Lat. —— 19 S.
Departure —— 29 W.
Latitude by D.R. 46 00 N.
Lat. by Obſervation
Meridian Diſtance 4 51
Longitude made — 7 15
Longitude in —— 11 02

Note, In this Day's Work the Swell coming from the S.W. heaves the Ship towards the NE. and the Variation allowed upon makes NE. by N. for the laſt Courſe in the Traverſe Table.

H	K.	H K	F.	Courſes	Winds	Lee-way	Tranſactions, Saturday, May the 15th, 1775.
2	4			Calm			
4	4						Tried the Current, and found it to be ſet WSW. 1 Mile per Hour, at which Rate I allow it for this 24 Hours.
6	4						
8	4						
10	4						
12	4						Zenith Diſtance —— 27 52 S.
2	4						Declination —— 17 41 N.
4	4						
6	4						
8	4			S S W	W		
10	4						Variation 1 Point Weſterly.
12	4	1					

Courſe	Diſt.	S	W	LatbyDR	Lat. byOb	Mer. Diſt.	Lon.made	Lon. in
S 42 00 W	32	24	22	45 36 N.	45 33 N	1 13 W	7 50 W	11 37 W

Courſes	Diſt.	N.	S.	E.	W.
S by W.	60		10.8		2.1
SW by W	24		13.3		20.0
			24.1		22.1

Courſe —— S. 42 00 W
Diſtance —— 32 Miles
Diff. of Lat. —— 24 S.
Departure —— 22 W
Latitude by D.R. —45 36 N.
Latitude by Obſer.—45 33 N.
Meridian Diſtance — 5 13 W.
Longitude made —— 7 50 W.
Longitude in —— 11 37 W.

Note, The Current ſetting WSW. 1 Mile *per* Hour, I allow the Variation upon it, which makes it SW. by W. and ſet it in the Traverſe Table, with 24 Miles Diſtance, as above.

H	K.	H K	F	Courſes	Winds	Lee-way	Tranſactions, Sunday, May the 24th, 1776.
2	3			S by W	W by S		Moderate Gales and fair Weather, at 9 (a. m.) ſpoke with a Ship from Barbadoes, and bound for London.
4	3	1					
6	4						
8	4						
10	4						
12	4						
2	4						
4	4						
6	4						
8	4						
10	4						Variation 1 Point Weſterly.
12	4						

Courſe	Diſt.	S.	—	Lat by DR	Lat. by Ob	Mer. Diſt.	Lon made	Lon. in
South	103	103		44 00N.	43 50N.	5 13W.	7 50W.	11 37 W

By D.R. ſince laſt Obſer.

Courſe	South
Diſtance	93 Miles
Diff. of Lat.	93
Departure	00
Lat. by D.R.	44 00N.
Latitude by Obſervation	43 50N.

Corrected

Courſe	South
Diſtance	103 Miles
Diff. of Lat.	103 S.
Departure	00
Latitude by D.R.	44 00 N.
Lat. by Obſervation	43 50 N.
Meridian Diſtance	5 13W.
Longitude made	7 50W.
Longitude in	11 37W.

In this Day's Work, there being 10 Miles Difference between the Latitude by Dead-Reckoning and Obſervation, I am to Correct, and therefore I do not find the Meridian Diſtance, *&c.* by (D.R.) as I did when there was no Correction; but I mark them all down again as above, and Correcting (as in Caſe the Firſt, of the Rules for Correcting) becauſe my Courſe by D.R. ſince the laſt Obſervation was due South, I ſet them all down, as in the above Correction.

H	K.	H K	F	Courſes	Winds	Lee-way	Tranſactions, Monday, May the 25th, 1776.
2	4			SWbyS	WNW		
4	4	1					Moderate Gales and fine clear Weather.
6	4	1					
8	4	1					
10	4						
12	4						
2	4	1					
4	4	1		SSW.			
6	4						
8	4						
10	4						
12	4	1					Variation 1 Point Weſterly.

Courſe	Diſt.	S.	W	Lat by DR	Lat. by Ob	Mer. Diſt.	Lon made	Lon. in
S 18 00W	112	106	35	42 13N.	42 04N.	5 48W.	8 37W.	12 24W

Courſes	Diſt.	N.	S.	E.	W.
S S W	60		55.4		23.0
S by W	42		41.2		8.2
			96 6		31.2

Corrected
- Courſe — S. 18 00W.
- Diſtance — 112 Miles
- Diff. of Lat. — 106 S.
- Departure — 35W.
- Latitude by D.R. 42 13 N.
- Lat. by Obſervation 42 04 N.
- Meridian Diſtance 5 48W.
- Longitude made — 8 37W.
- Longitude in — 12 24W.

By D.R. ſince laſt Obſer.
- Courſe — S. 18 00W.
- Diſtance — 102 Miles
- Diff. of Lat. — 97 S
- Departure — 31 W
- Lat. by D.R. — 42 13N.
- Latitude by Obſervation 42 04N.

Having found as far as to the Latitude by Dead Reckoning and Obſervation, I ſee they differ 9 Miles, therefore I Correct (by Caſe the 2d) becauſe my Courſe found by Dead-Reckoning ſince the laſt Obſer. is leſs than 33 Deg. and the Reſult is as above.

H	K.	H K	F.	Courſe	Winds	Lee-way	Tranſactions, Tueſday, May the 26th, 1776.
2	4			S W	N W		Moderate and Fair.
4	4	1					
6	4						
8	4						
10	3	1		SW b W			
12	4						
2	4						
4	3	1			N		
6	3	1					
8	3	1					
10	3	1			N E		Variation ¾ Point Weſterly.
12	3	1					

Courſe	Diſt.	S.	W	Lat by D R	Lat. by Ob	Mer. Diſt	Lon. made	Lon. in
S 47 00 W	78	53	57	40 59 N.	41 11 N.	6 45 W.	9 53 W	13 40 W

Courſes	Diſt.	N.	S.	E.	W.
SW b S ¼ W	33		26.5		19.7
SW ½ W	58		38.9		43.0
			65.1		62.7

Cor-rected

Courſe —— S. 47 00 W.
Diſtance —— 78 Miles
Diff. of Lat. —— 53 S.
Departure —— 57 W.
Latitude by D. R. 40 59 N.
Lat. by Obſervation 41 11 N.
Meridian Diſtance 6 45 W.
Longitude made — 9 53 W.
Longitude in —— 13 40 W.

By D. R. ſince laſt Obſer.

Courſe —— S. 44 00 W.
Diſtance —— 91 Miles
Diff. of Lat. —— 65 S.
Departure —— 63 W.
Lat. by D. R. —— 40 59 N.
Latitude Obſervation — 41 11 N.

New Departure —— 51
Departure by D. R. —— 63

Their Sum —— 114

½ Sum, or True Dep. —— 57 Miles

In this Caſe, the Courſe by D. R. ſince the laſt Obſervation, being more than 33, and leſs than 67 Degrees, I corrected by Caſe the 3d.

H	K.	H K	F.	Courſes	Winds	Lee-way	Tranſactions, Wedneſday, May the 27th, 1776.
2	4			W	S E		
4	4						Cloudy the firſt Part, the latter Moderate and Fair.
6	4						
8	4						
10	4				E.		
12	4						
2	4						
4	4						
6	4						
8	3	1					
10	3	1					Variation ¼ Point Weſterly.
12	3	1			N N E		

Courſe	Diſt.	—	W	Lat by DR	Lat. by Ob	Mer. Diſt.	Lon. made	Lon. in
Weſt	93	—	93	41 0 N.	41 11 N.	8 18 W	11 56 W	15 43 W

Courſes	Diſt.	N.	S.	E.	W.
W by S ½ W	93		9.1		
		Diff. Lat.			Dep.

Corrected by Caſe the 4th, the Courſe by D.R. being more than 6 Points.

By D.R. ſince laſt Obſer.
- Courſe —— W. by S. ½ W.
- Diſtance —— 93 Miles
- Difference of Lat. — 9 S.
- Departure —— 93 W.
- Latitude by D.R. — 41 02 N.
- Lat. Obſer. —— 41 11 N.

Corrected
- Courſe —— Weſt
- Diſtance —— 93 Miles
- Diff. of Lat. —— 00
- Departure —— 93 W.
- Latitude by D.R. — 41 02 N.
- Latitude by Obſer. — 41 11 N.
- Meridian Diſtance — 8 18 W.
- Longitude made —— 11 56 W.
- Longitude in —— 15 43 W.

Note, When the Courſe is due Eaſt or due Weſt, as in this Caſe, then the Difference of Longitude cannot be found by the Courſe, and the Meridional Difference of Latitude as before, but muſt be found as follows; look in the Tables of Difference of Latitude and Departure, for the neareſt Degree to your Latitude, which here is 41, and in ſome of the Difference of Latitude Columns belonging to that Degree find your Departure, which in this Caſe is 93, the Diſtance anſwering to that which is 123, gives your Difference of Longitude.

H.

H	K.	H K	F.	Courſes	Winds	Lee-way	Tranſactions, Thurſday, May the 28th, 1776.
2	4	1		S by W	N.		Little Wind and Hazy all theſe 24 Hours.
4	3	1					
6	3						
8	3						
10	3			S S W.	N W.		
12	3						
2	3						
4	3						
6	3			S b W ½ W	W N W		
8	3						Variation ½ Point Weſterly.
10	3						
12	3						

Courſe	Diſt.	S.	W	Lat by D R	Lat. by Ob	Mer. Diſt	Lon. made	Lon. in
S 11 00 W	76	74	14	39 57 N.		8 32 W.	12 15 W.	16 02 W

Courſes	Diſt.	N.	S.	E.	W.
S. ½ W.	28		27.9		2.7
S b W ½ W	24		23.0		7.0
S by W	24		23 5		4.7
			74.4		14.4

By D. R.

Courſe	S. 11 00 W.	
Diſtance	76	Miles
Diff. of Lat.	74	S.
Departure	14	W.
Latitude by D.R.	39 57	N.
Lat. Obſervation		
Meridian Diſtance	8 32	W.
Longitude made	12 15	W.
Longitude in	16 02	W.

Note, Having in the foregoing Day's Works given an Example to every Caſe of Correcting, (for a ſingle Day) I ſhall now ſet down two or three Days Work by D.R. and then ſhew how to correct them all together by an Obſervation, that is, how to correct for a longer Time than one Day.

H	K.	H K	F.	Courſes	Winds	Lee-way	Tranſactions, Friday, May the 29th, 1776.
2	3	1		S S W	W by N		
4	3	1					Little Wind and Cloudy.
6	4						
8	4						
10	4			S by W	W		
12	3	1					
2	3						
4	3	1		S.			
6	3	1			W S W		
8	3						
10	3			S b W $\frac{1}{2}$ W	W		Variation $\frac{3}{4}$ Point Weſterly.
12	3	1					

Courſe	Diſt.	—	W	Lat by DR	Lat. by Ob	Mer. Diſt.	Lon. made	Lon. in
S. 12 00 W	83	82	17	38 35 N.		8 49 W	12 38 W	16 25 W

Courſes	Diſt.	N.	S.	E.	W.
S b W $\frac{3}{4}$ W	30		28.2		1.1
S $\frac{3}{4}$ W	29		28.7		4.3
S $\frac{1}{4}$ E	12		12.0	0.6	
S b W $\frac{1}{4}$ W	13		12.6		3.2
			81.5	9.6	17.6
					0.6
					17.0

Corrected

Courſe —— S. 12 00 W.
Diſtance —— 83 Miles
Diff. of Lat. —— 82 S.
Departure —— 17 W.
Latitude by D.R. —38 35 N.
Latitude by Obſer.
Meridian Diſtance — 8 49 W.
Longitude made —— 12 38 W.
Longitude in —— 16 25 W.

H	K.	H K	F.	Courſes	Winds	Lee-way	Tranſactions, Saturday, May the 30th, 1776.
2	3	1		S b W ¾ W	W by N		Little Wind and Fair Weather.
4	3	1					
6	3	1					
8	3						
10	3	1					
12	3						
2	3			S by W	W		
4	3						
6	3						
8	3						Variation ¼ Point Weſterly.
10	3						
12	3						

Courſe	Diſt.	S.	W	Lat by DR	Lat. by Ob	Mer. Diſt	Lon. made	Lon. in
S 14 00 W	74	72	17	37 23 N.		9 06 W.	13 1 W.	16 48 W

Courſes	Diſt.	N.	S	E.	W.
S b W ½ W	46		44.0		13.3
S ¾ W	28		27.7		4.1
			71.7		17.4

By D. R.

Courſe —— S. 14 00 W.
Diſtance —— 74 Miles
Diff. of Lat. —— 72 S.
Departure —— 17 W.
Latitude by D.R. 37 23 N.
Lat. Obſervation ——
Meridian Diſtance 9 06 W.
Longitude made — 13 01 W.
Longitude in —— 16 48 W.

H	K.	H K	F.	Courſes	Winds	Lee-way	Tranſactions, Sunday, May the 31ſt, 1776
2	4			S by W	W by N		
4	4						Moderate Gales and Fair.
6	4						
8	4						
10	4						
12	4						
2	4			S b W ¼ W			
4	4						
6	4						
8	4						
10	4						Variation ¼ Point Weſterly.
12	4						

Courſe	Diſt.	S.	W	Lat by D R	Lat. by Ob	Mer. Diſt	Lon. made	Lon. in
S 9 00 W.	108	107	17	35 48 N.	35 36 N.	9 23 W.	13 19 W	17 06 W

Courſes	Diſt.	N.	S	E.	W.
S ¾ W	48		47.5		7.0
S by W	48		47.1		9.4
			94.6		16.4

By D.R. ſince yeſterday noon.
- Courſe — S. 10 00 W
- Diſtance — 96 Miles
- Diff. of Lat. — 95 S.
- Departure — 16 W.
- Lat. by D.R. — 35 48 N.
- Latitude Obſervation — 35 36 N.

Now being to correct from the laſt Obſervation, which was on Wedneſday, May 16th, I take the Northing, Southing, Eaſting and Weſting for every Day ſince, and bring them into a Traverſe-Table as follows.

By D.R. ſince the laſt Obſervation.

	N.	S.	E	W.
On Thurſday, May 17		74		14
On Friday 18		82		17
On Saturday the 19		72		17
On this Day as above		95		16
Whole Diff. of Lat. by D.R. S. 323 Dep. 64 W				

Gives Courſe by D.R. ſince laſt Obſer. S. 11.00 W

My

My Courſe found by D.R. ſince the laſt Obſervation, being S. 11 00 W. which is leſs than 33 Degrees, I am to correct by Caſe the 2d, and to find every Thing, except the Diſtance, as follows;

First, *For the true Difference of Latitude.*

Take the Latitude by the laſt Obſervation	41 11 N.
And the Latitude by Obſervation To-day	35 36 N.
Gives the Difference of Latitude	5 35
Which, multiplied by 60, makes	335 Miles

Second, *For the true Courſe.*

The Courſe by D. R. ſince the laſt Obſervation, being S. 11 00 W. I ſet it down for the true Courſe, as *per* Rule in Caſe the 2d.

Third, *For the true Departure.*

With the true Courſe 11 Degrees, and the true Difference of Latitude (divided by 2, becauſe too big to be found in the Tables) which makes it 167.5, (by *Plane Sailing*, Caſe the 2d) I find the Departure 32.6, which multiplied by the ſame Number the Difference of Latitude was divided by, *viz.* 2, gives 65.2 Tenths for the true Departure.

Fourth, *For the Meridian Diſtance.*

Take the Meridian Diſtance at the laſt Obſervation	8 18 W.
And the true Departure	1 05
Gives the Meridian Diſtance To-day	9 23 W.

Fifth, *For the Difference of Longitude.*

Take the Meridional Parts of the laſt Obſervation	2716
And Meridional Parts of To-day's Obſervation	2288
Gives the Meridional Difference of Latitude	428
With the Half of which	214

(becauſe the whole is too big to be found in the Tables) and the true Courſe 11 Degrees, I find the Difference of Longitude 41.6, which doubled, (becauſe the other was halved) gives, for the whole Difference of Longitude, 83 Miles.

Sixth, *For the Longitude made.*

Take the Longitude made in the laſt Obſervation	11	56 W.
And the whole Difference of Longitude	1	23 W.
Gives the Longitude made	13	19 W.

Seventh, *For the Longitude in.*

Take the Longitude in the laſt Obſervation	15	43 W.
And the whole Difference of Longitude	1	23 W.
Gives the Longitude in	17	06 W.

Courſe	S. 11 00 W.	} theſe to be found again as follows,	S. 9 00 W.
Diſtance			108 Miles.
Difference of Latitude	335 S.		107 S.
Departure	65 W.		17 W.
Corrected Latitude by D.R.	35 48 N.		
Lat. by Obſervation	35 36 N.		
Meridian Diſtance	9 23 W.		
Longitude made	13 19 W.		
Longitude in	17 06 W.		

The Courſe, Difference of Latitude and Departure, as above, being what has been made ſince the laſt Obſervation (which was four Days ago) and as it is uſual to ſet them down only as they are made from Noon to Noon, therefore they are to be rubbed out, and found again as follows.

Firſt, Take the Latitude by D.R. Yeſterday	37	48 N.
And the Latitude by Obſervation To day	35	36 N.
Gives the Difference of Latitude	1	47
Second, Take Yeſterday's Meridian Diſtance	9	06 W.
And the Meridian Diſtance To-day	9	23 W.
Gives the Departure	0	17

Then with the Difference of Latitude 107, and the Departure 17 Miles (by *Plane Sailing*, Caſe 6.) I find the Courſe to be 9 Degrees, Diſtance 108 Miles, as above.

H	K.	H K	F.	Courſes	Winds	Lee-way
				S by W	N.	
2	5					
4	5					
6	6	1				
8	7					
10	7	1				
12	8					
2	8					
4	8					
6	8	1				
8	8	1				
10	9					
12	9					

Tranſactions, Friday, May the 24th, 1775.

By Reckoning I make my Courſe from the *Start* to the Iſland of *Madeira* S. 32 00W. Diſtance 420 Leagues; Meridian Diſtance and Difference of Latitude as underneath.

At Noon ſaw the Iſland of *Madeira* bearing SW. by W. Diſtance 14 Leagues. Variation 00.

Courſe	Diſt.	S	W	Lat by DR	Lat. by Ob	Mer. Diſt.	Lon. made	Lon. in
S 19 00W	213	202	70	32 14 N.		10 32W	14 43 W	18 30W

Courſes	Diſt.	N.	S.	E.	W.
S by W	182		178.5		35.5
SW by W	42		23.3		34.9
			201.8		70.4

Courſe —— S. 19 00 W.
Diſtance —— 213 Miles
Diff. of Latitude 202 S.
Departure —— 70 W.
Latitude by D.R. 32 14 N.
Meridian Diſtance 10 33 W.
Longitude made— 14 43 W.
Longitude in —— 18 30 W.

The Bearing of the Land being S.W. by W. diſtant 14 Leaguee, or 42 Miles, I ſet them in the Traverſe-Table as a Courſe, &c.

It being cuſtomary upon making the Land, to find what Courſe and Diſtance the Ship has made, by reckoning from the Place ſailed from, to the Place arrived at, it is to be done as follows:

CASE the Firſt. *When you keep the Account of Longitude in.*

With the Latitude and Longitude of the Place you ſailed from, and the Latitude and Longitude you are in by your Reckoning on the Day you make the Land, find the proper Difference of Latitude, the Meridional Difference of Latitude, and the Difference of Longitude in Miles, and with them find the Courſe and Diſtance, as it is ſhewn at large in *Mercator's Sailing*, Caſe the Firſt, Page 55.

CASE the Second, *When you keep the Account of Longitude made,*

Then the proper Difference of Latitude, and the Meridional Difference of Latitude are to be found as before, and the Difference of Lon-

Longitude is to be found by bringing the Longitude made into Miles, with which proceed, as in Caſe the Firſt.

The Agreement between theſe two Ways may be ſeen as follows:

On the 19th of May, when I made the Land, my Longitude in was ——— 18 30 W.	On the ſame Day my Longitude made was ——— 14 43 W.
Longitude of the Start, or Place I ſailed from 3 47 W.	Which multiplied by 60,
The Difference of Longitude ——— 14 43	Makes the Diff. of Lon. 883 Mi
Which multiplied by ——— 60	The ſame as in the other Caſe.
Makes ——— 883 Miles	

To find the Bearing and Diſtance of any Place from the Ship, upon any given Day.

Example. Suppoſe I would know how *Madeira* bore off me, and what Diſtance on the 14th of *May*, by the foregoing Journal.

Firſt, Suppoſing I kept only the Account of Longitude in;

Then, with the Latitude in, 41 11 N.	2716 M. P.	And with Long. in — 15 43 W.
And the Latitude of Madeira 32 44 N.	2080 M. P.	And the Long. Madeira 7 26 W.
I find the proper Diff. of Lat. 8 27	636	I find the Diff. Long. 1 43 W.
Which multiplied by 60 makes 507 Miles	M. D. L.	Which makes ——— 103 Miles.

Then with that Meridional Difference of Latitude, and Difference of Longitude, I find the Courſe to be S. 09 00 W. and the Diſtance 501 Miles, as in *Mercator*, Caſe 1.

But if I had kept only the Account of Longitude made, which is Difference of Longitude, then,

With the Longitude ſailed from ——— 3 47 W.
And the whole Diff. of Long. or Long. made — 11 56 Weſterly,

By Rules for Long. p. 107, I ſhould have found Lon. in 15 43 W.
And then I have given the Latitude and Longitude in, *&c.* as before.

I have, in the foregoing Journal, ſhewn how to correct, either for a ſingle Day, or for a longer Time, and given Examples of every Caſe for correcting from one Obſervation to another; but as it may happen that you may be ſome Days at Sea, from the Time of your leaving the Land before you have an Obſervation, and that when you get the firſt Obſervation, you may have Occaſion to correct, and there being much the ſame Difference between working the Correction from one Obſervation to another, and between the firſt Obſervation and the Land, as there is between working the firſt Day's Work, and any of the following ones, I ſhall here give an Example from the foregoing Journal.

To correct from the Time of Leaving the Land to the first Observation.

Example, Suppose that in the foregoing Journal, on the 3d of *May*, I was by Observation in Latitude 45 10 N. my Latitude by D.R. being 45 23 N. my Sounding by D.R. 95, and Westing 24.

Now being to correct, and having no Observation before To-day, I must correct from the very Beginning of my Journal, that is, from the Time of my leaving the Land, by bringing the Northing, Southing, Easting and Westing, for every Day I have been at Sea, into a Traverse-Table as follows.

By D.R. from the Time of leaving the Land.

	N.	S.	E.	W.
On the first Day.		93		53
On the second Day.		96		61
On the Day I correct.		95		24
Whole Diff. of Lat. by D.R. S. 284 Dep. 138 W.				

Gives the Course by D.R. from the Time of leaving the Land S. 26.00 W.

The Course found by D. R. from the Time of leaving the Land, being less than 33 Degrees, I am to correct by Case the Second, and to find every Thing, except the Distance as follows:

First, *For the true Difference of Latitude.*

Take the Latitude of the Place sailed from —— 50 07 N.
And the Latitude in by Observation —————— 45 10 N.
Gives the true Difference of Latitude ———— 4 57 or 297 Miles.

Second, *For the true Course.*

The Course by D.R. since the Time of leaving the Land being S. 26 00 W. I set down for the true Course, as by the Rules for correcting,

Third, *For the true Departure.*

With the true Course 26 Degrees, and half the true Difference of Latitude 148.5, (because the whole is to big to be found in the Tables) by *Plane-Sailing*, Case the Second. I find the Departure 72.3, which being doubled (because the Difference of Latitude was halv'd) gives 144.6 for the true Departure.

Fourth, *For the Meridian Distance.*

Whenever you correct from the Time of your leaving the Land, (as you do here) the Meridian Distance will always be the same as the true De-

Departure found by correcting, which in this Caſe is 145 Miles, or 2.25W.

Fifth, *For the Difference of Longitude.*

Take the Meridional Parts of the Latitude ſail'd from —— 3485
And of the Latitude in by Obſervation —— 3044
Gives the Meridional Difference of Latitude —— 441
With the Half of which —— 220.5

(becauſe the whole is to big to be found in the Tables) and the true Courſe 26 Degrees, (as directed in the firſt Day's Work, Page 134) I find the Difference of Longitude 107.4, which doubled (becauſe the other was halv'd) gives the true Difference of Longitude 214.8.

Sixth, *For the Longitude made.*

Whenever you correct from the Time of your leaving Land, as you do in this Caſe, then the Longitude made will always be the ſame as the whole Difference of Longitude found by the Correction, which in this Caſe is 215 Miles, or 3.35 W.

Seventh, *For the Longitude in.*

Take the Longitude of the Place you ſail'd from —— 3 47 W.
And the whole Difference of Longitude —— 3 35 W.
Gives the Longitude in —— 7 22 W.

Corrected:

Courſe	S. 26 00 W.
Diſtance	
Diff. of Lat.	297 S.
Departure	145 W.
Latitude by D. R.	45 23 N.
Lat. by Obſervation	45 10 N.
Meridian Diſtance	2 25 W.
Longitude made	3 35 W.
Longitude in	7 22 W.

These to be found again:

S.	16 00 W.
	13 Miles
	108 S.
	31 W.

The Courſe, Difference of Latitude and Departure, as above, being what has been made in the whole, from the Time of leaving the Land, which is three Days, and it is uſual to ſet them down only as they are made from Noon to Noon, therefore they are to be rubbed out, and found again as follows:

Firſt, Take the Latitude by D R. Yeſterday —— 46 58 W.
And the Latitude by Obſervation To-day —— 45 10 N.
Gives the Difference of Latitude —— 1 48

Second, Take the Meridian Diſtance Yeſterday —— 1 54 W.
And the Meridian Diſtance To-day —— 2 25 W.
Gives the Departure —— 0 31

Then

Then with the Difference of Latitude 108, and the Departure 31 Miles (by *Plane Sailing*, Caſe 6.) I find the Courſe to be S. 16 00 W. Diſtance 113 Miles, as above.

Having, in the preceding Journal ſhewn how to find what Latitude and Longitude the Ship is in, on any Day, I ſhall in the next Place, ſhew how

By that Longitude and Latitude in, to mark off the Place of the Ship on the Mercator's Chart.

Rule. Lay a Ruler a-croſs the Chart, in the Latitude your Ship is in, then look upon the Equinoctial, or line marked with the Degrees of Longitude, for the Longitude your Ship is in by your Reckoning, and ſetting one Foot of your Compaſſes in that Longitude, take the neareſt Diſtance to ſome North and South Line, and from where that Line croſſes the Edge of the Ruler that lies in the given Latitude, lay off that ſame Diſtance, by the Edge of the Ruler, to the Right Hand, if the Longitude you are in was to the Right Hand of the North and South Line, or to the Left Hand, if it was to the Left; where this falls will be the Place of the Ship. But this will only do when the Longitude marked off the Chart, and your Reckoning of Longitude in are both counted from the ſame Meridian, therefore for a general Rule, take the following:

By the Latitude in, and Longitude made, to mark off the Ship's Place, &c.

Rule. Set one Foot of your Compaſſes in the Place you take your Departure from, and take the neareſt Diſtance to ſome North and South Line, and from where that Line falls upon the Equinoctial or Line marked with the Degrees of Longitude, ſet off that Diſtance the ſame Way as the Place lies from it, (that is, to the Right Hand, if the Place lies to the Right Hand of the North and South Line, or to the Left Hand, if it lies to the Left (and make a Mark with a Black Lead Pencil; this Mark will ſerve to mark off by, until you come to take a new Departure, and then you rub it out, and make a new one, as before.

Then lay a Ruler a-croſs the Chart in the Latitude you are in, and taking ſo many Degrees in your Compaſſes (from the Line of Longitude) as your Longitude made comes to, ſet them off from your Black Lead Mark, to the Eaſtward, if the Longitude made be Eaſt, or to the Weſtward, if it be Weſt; where this falls will be the Longitude the Ship is in by the Chart, from which take the neareſt Diſtance to ſome North and South Line, and from where that Line, *&c.* as in the firſt Caſe.

The

24-175

The Ship's Place on the Chart being found, as before taught, it remains in the next Place, to ſhew how to find the Bearing and Diſtance of any Place from the Ship; and firſt,

To find how any Place bears from the Ship.

Rule Lay a Ruler from the Place of the Ship to the Place you would know the Bearing of, then ſet one Foot of your Compaſs in the Center of ſome Compaſs near the Ruler, and take the neareſt Diſtance to the Edge of the Ruler, then run one Foot of your Compaſſes along by the Edge of the Ruler, and obſerve what Point of the Compaſs the other comes neareſt to, which will be the Bearing required.

To find the Diſtance of any Place from the Ship.

Caſe the 1ſt. If the Place be in the ſame Longitude that the Ship is in (that is, if it bears due North or due South) then the Difference of Latitude between them, (found as by the Rules for Latitude, Page 105) and turned into Miles, or Leagues, will be the Diſtance.

Caſe the 2d. If the Place be in the ſame Latitude that the Ship is in, that is, if it bears due Eaſt or due Weſt, then take half the Diſtance between the Ship and the Place, in your Compaſſes, and ſetting one Foot (on the Line mark'd with Degrees of Latitude) in the Latitude the Ship is in, ſee what Latitudes the other Foot will reach to, both above and below it; the Difference between theſe two Latitudes, found as per Rule for Latitude, will be the Diſtance required.

Caſe the Third. If the Place be neither in the ſame Latitude nor Longitude with the Ship, then take the Difference of Latitude between them in Degrees, from the Equinoctial Line, and laying a Ruler from the Ship to the Place, apply one Foot of the Compaſſes ſo to the Edge of the Ruler, that the other Foot turned about may juſt touch ſome Eaſt and Weſt Line that is croſſed by the Ruler; then take the Diſtance along the Edge of the Ruler, from the Place where the Compaſſes reſted, to the Place where the Ruler croſſes the ſaid Eaſt and Weſt Line; that Diſtance meaſured on the Equinoctial, or Degrees of Longitude, will give the Diſtance in Degrees, which you may turn into Miles or Leagues, and in the ſame Manner as you find the Bearing and Diſtance of any Place from the Ship, you may alſo find the Bearing and Diſtance of one Place from another.

F I N I S.

Curtis Reed's Book - 1779

Stephens Davison Dayton

Assistant Wrote at Sea

in Lat^{d} 26.00 North and

Long^{t} 69.00 West august

the 14th 1784

David Clarke Dayle

Assistant Bought of

Barzillai Davison March 10th 1785

with a quadrant at the

Price of £3.13.0

119
818-824

79
812-17

D775
H347S